AN ASSESSMENT OF EXTENSION PERSONNEL'S ROLES AMIDST NATURAL DISASTERS

A Thesis

by

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ABSTRACT

The purpose of this study was to evaluate the current roles of extension personnel through their experience in training, communication with elected officials, communication with other agencies and the community during and after the natural disaster, and the personal and professional needs of extension personnel. To address the research questions and respective objectives of this study, data were obtained from independent evaluation efforts conducted by Texas A&M AgriLife Extension Service's Organizational Development Unit and evaluators in The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS).

Data included in this study were collected from extension personnel in Texas and Florida between March and November 2018 who were involved in Hurricane Harvey, the 2017 Texas Panhandle fires, and Hurricane Irma. After two points of contact for Hurricane Harvey and one point of contact for Texas Panhandle and Hurricane Irma, 200 responses were deemed usable.

Results indicated extension personnel were not adequately prepared to serve in their emerging role as the hurricane or wildfire happened in their region. Respondents from Florida, Hurricane Harvey, and Texas Panhandle indicated they would like more training in professional development to assist clientele, stronger communication with extension leadership, stronger communication with elected officials, and a clear outline of their job expectations amidst natural disasters to balance personal and professional needs.

This study can guide extension leadership regarding the best trainings, educational programs, forms of communication, and hardship prevention when assessing the changing roles of extension personnel. More research is needed to further assist extension personnel in training program implementation at local and state levels to provide further clarification on stress management, work life balance, technology implementation, and communication.

DEDICATION

For my Papa. Michael Joseph Hiss, December 22, 1938 – December 17, 2018. Thank you for always believing in my education. I would not be who I am today without your constant love and guidance.

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NOMENCLATURE

ACF	Advocacy Coalition Framework
APHIS	Animal and Plant Inspection Service
CSREES	Cooperative State Research, Education, and Extension Service
EDEN	Extension Disaster Education Network
FSA	Farm Service Agency
FEMA	Federal Emergency Management Agency
GAO	Government Accountability Office
MAT	Mitigation Assessment Team
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
OMB	Office of Management and Budget
TEEX	Texas A&M Engineering Extension Service
UF/IFAS	University of Florida's Institute of Food and Agricultural Services
EPA	US Environmental Protection Agency
OSHA	US Occupational Safety and Health Administration

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CHAPTER I

INTRODUCTION

Natural Disasters

Natural phenomena have always existed and played a role in different civilizations throughout history (Tasci & Unver, 2017). For tens of thousands of years, countless natural phenomena have occurred. Evidence of this, primarily of earthquakes, have been discovered in archeological ruins and works of literature (Tasci & Unver, 2017). The World Health Organization defines a natural disaster as a "state of emergency that seriously disrupts the functioning of a community causing widespread administrative and traumatic distress that exceeds the ability of the affected community or society to cope with routine interventions using its own resources" (Tasci & Unver, 2017, p. 166). The Center for Disease Control and Prevention (2018) categorizes natural disasters as earthquakes, landslides and mudslides, volcanoes, extreme heat, lightning, wildfires, floods, tornadoes, winter weather, hurricanes, and tsunamis.

According to the National Oceanic and Atmospheric Administration (NOAA), tropical cyclones are the costliest natural disaster (n.d.). Since 1980, the United States has sustained at least 219 weather and climate disasters with a total cost of these events exceeding $1.5 trillion (NOAA, n.d.). Including Hurricane Harvey, Irma, and Maria, 38 tropical cyclones impacted the United States in 2017 and caused at least $850.5 billion in damages (NOAA, n.d.). Following tropical cyclones, the costliest natural disasters are (NOAA, n.d.):

1. Drought, with an average cost of $9.5 billion per event;

2. Flooding, with an average cost of $4.3 billion per event;
3. Wildfires, with an average cost of $3.6 billion per event;
4. Freezes, with an average cost of $3.5 billion per event;
5. Winter storms, with an average cost of $3.1 billion per event; and
6. Severe storms, with an average cost of $2.3 billion per event.

It is inevitable that most natural phenomena will result in material and moral damage due to the severity of the disaster (Tasci & Unver, 2017). Keeping this destruction and loss at a minimum can only be accomplished when nature is understood through a scientific approach to disaster education (Tasci & Unver, 2017). By understanding the patterns of natural disasters, awareness is created for the public through educational programs, and teaches affected areas how to protect themselves (Tasci & Unver, 2017).

Texas Hurricane and Wildfires

Hurricane Harvey

Hurricane Harvey first formed as a weak tropical storm that affected the Lesser Antilles and dissipated in the Caribbean Sea (Blake & Zelinsky, 2018). Hurricane Harvey re-formed over the Bay of Campeche and intensified into a category four hurricane before making landfall on the Texas coast (Blake & Zelinsky, 2018). The center of the storm hung over the Texas coast for four days, where it rained more than 60 inches over southeastern Texas (Blake & Zelinsky, 2018). These rains caused catastrophic flooding, making Hurricane Harvey the second-most costly hurricane in the history of the United States, behind hurricane Katrina in 2005 (Blake & Zelinsky, 2018).

Hurricane Harvey produced 52 tornadoes; of which, about half of them occurred near and to the south of Houston (Blake & Zelinsky, 2018). As a result of Hurricane Harvey, tornadoes were reported in Louisiana, Mississippi, Alabama, and Tennessee (Blake & Zelinsky, 2018). There were 68 direct deaths linked to Hurricane Harvey. Many of those were due to the amount of flooding (Blake & Zelinsky, 2018). There were 36 reported deaths in Harris County, which is in the Houston metro area (Blake & Zelinsky, 2018).

According to Blake and Zelinsky (2018), Harvey is the deadliest hurricane in the United States since Hurricane Sandy in 2012 and is the overall deadliest hurricane to hit Texas since 1919. As of May 2018, NOAA estimated that Hurricane Harvey caused $125 billion in damage (Blake & Zelinsky, 2018). In southeastern Texas over 300,000 structures and up to 500,000 cars were reported as flooded (Blake & Zelinsky, 2018).

In the wake of Hurricane Harvey, Governor Abbot appointed John Sharp, Chancellor of the Texas A&M University System, as the Commissioner of the Rebuild Texas initiative. Chancellor Sharp appointed Texas A&M AgriLife Extension (AgriLife Extension) to mitigate disaster relief within the 60 counties who were impacted by Hurricane Harvey. It became the role of AgriLife Extension personnel to assist their local communities with emergency management and providing local officials with reports on their efforts within the community.

Texas Panhandle Fires

Texas is ranked second in the *Top 10 Most Wildfire Prone States, 2017*, which was determined by 715,300 households at high or extreme risk from wildfires according

to the 2010 United States Census (Insurance Information Institute, n.d.). In 2017 there were 9,827 wildfires in Texas with a total of 734,682 acres burned (Insurance Information Institute, n.d.). According to the Texas Forest Service, at least 436,000 acres burned in the Texas panhandle from the Perryton Fire, Lefors East Fire, and Dumas Complex Fire (Wildfire Today, 2017). The Perryton Fire burned 315,135 acres and affected Ochiltree, Lipscomb and Hemphill counties (Wildfire Today, 2017). The Lefors East Fire burned 92,571 in Gray county (Wildfire Today, 2017). The Dumas Complex Fire burned in Potter County and burned 29,197 acres (Wildfire Today, 2017).

During 2017, the numbers of acres burned in the United States was close to breaking a record (Gabbert, 2018). An estimated 9,781,062 acres were burned, which is 49 percent higher than the average in the past 10 years (Gabbert, 2018). The intensity of wildfires has increased while the number of fires has decreased. In 2017 there were 66,131 fires reported, which was four percent lower than the average over the past 10 years (Gabbert, 2018).

Florida Hurricane

Hurricane Irma

Hurricane Irma made seven landfalls from August 30 to September 12, 2017 (Cangialosi, Latto, & Berg, 2018). Four of the landfalls were a category five hitting the northern Caribbean Islands (Cangialosi et al., 2018). Hurricane Irma continued upwards to hit the Florida Keys as a category four and struck southwestern Florida as a category three hurricane (Cangialosi et al., 2018). The hurricane continued upwards along central Florida with hurricane conditions decreasing as Hurricane Irma's center approached the

outskirts of Orlando and Tampa (Cangialosi et al., 2018). Tropical storm conditions were reported on both the west and east coasts of the state (Cangialosi et al., 2018). Hurricane Irma's power was so immense that even though it hit on the southwestern coast of Florida, there was storm surge flooding of three to five feet along the northeastern coast from Cape Canaveral to the Florida-Georgia border (Cangialosi et al., 2018).

Hurricane Irma produced rainfall totals of 10 to 15 inches across the peninsula and the Florida Keys (Cangialosi et al., 2018). Tropical storm conditions continued to affect Georgia and South Carolina on September 11 and September 12, 2017 (Cangialosi et al., 2018). Hurricane Irma produced 25 tornadoes with 21 primarily along the east coast of central and northern Florida and four in South Carolina (Cangialosi et al. 2018). Hurricane Irma caused 47 direct deaths due to strong winds, heavy rains, and high surf in the Caribbean Islands and the southeastern United States (Cangialosi et al., 2018). As a result of Hurricane Irma, there were an additional 82 indirect deaths, 77 of those deaths were in Florida (Cangialosi et al., 2018). Hurricane Irma is the fifth costliest hurricane to affect the United States totaling to $50 billion in damages (Cangialosi et al, 2018).

Hurricane Irma is the strongest Atlantic basin hurricane outside the Gulf of Mexico and the Caribbean Sea to be recorded in history (CNN, 2017). Hurricane Irma was categorized as a hurricane from August 31 to September 11, 2017. The storm stretched 650 miles from east to west affecting nine US states and damaged 95% of the buildings on Barbuda (CNN, 2017). Hurricane Irma killed 36 people in the Caribbean, with 10 deaths from Cuba before impacting the United States (CNN, 2017). Hurricane Irma hit southwestern Florida on September 10, 2017 leading to tornadoes and storm-

surge flooding. 5.6 million people were ordered to evacuate before it made two landfalls (CNN, 2017). During the wake of the storm 6.2 million were without power in Florida, 1.4 million were without power in Georgia, 200,000 were without power in South Carolina (Yan, Simon, & Karimi, 2017).

Purpose and Objectives

The purpose of this thesis was to assess Extension personnel's responsibilities amongst recent natural disasters in two different states and three different sets of communities. The primary areas of focus were Hurricane Harvey in Texas, Hurricane Irma in Florida, and the Texas Panhandle fires in 2017. Data was collected by surveying Texas and Florida extension personnel who served their local communities during a natural disaster. There were eight areas surveyed to assess the changing roles of extension personnel including personal needs, professional needs, communication, technology, organizational coordination, agencies, impact, and damage.

Research Questions

Seven research questions (RQ) were used to guide this study. Where applicable, research objectives (RO) were used to subdivide research questions (i.e., RQ1 and RQ4) into smaller sections for describing analyses and reporting results.

RQ1. What were the personal and occupational needs of extension personnel after natural disasters?

RO1.1. Describe extension professionals' personal needs.

RO1.2. Describe extension professionals' occupational needs.

RQ2. What communication channels were being used by extension personnel after natural disasters?

RQ3. What forms of technology were being used by extension personnel after natural disasters?

RQ4. What forms of intra-organizational coordination were being used by extension personnel after natural disasters?

RO4.1. Describe educational programs currently utilized.

RO4.2. Describe extension's educational program effectiveness amidst natural disasters.

RO4.3. Describe suggestions for future programs.

RQ5. What agencies did extension personnel access or contact before, during, and/or after a natural disaster?

RQ6. What was the impact that extension personnel made in local communities after a natural disaster occurred?

RQ7. What was the damage assessed in local communities by extension personnel after a natural disaster occurred?

Definition of Terms

Extension personnel - Extension personnel provide non-formal education and learning activities to farmers, residents of rural communities, and people living in urban areas nationwide (USDA, n.d.). Extension personnel take knowledge gained through research and education from universities and take it locally to the people (USDA, n.d.). Extension personnel seek to educate farmers on business operations and on modern agricultural

science and technologies and improve the lives of consumers and families through nutrition education, food safety and training, and youth leadership development (USDA, n.d.).

Hurricane - When a storm's wind speed becomes reach 74 mph it is no longer a tropical storm and is categorized as a hurricane (NOAA, 2018). The Saffir-Simpson Hurricane Wind Scale is on a 1 to 5 rating based on the wind speed of the hurricane (NOAA, 2018). The higher the category, the greater the chance of property damage (NOAA, 2018).

- Category 1 hurricane - Very dangerous winds will produce some damage due to wind speeds of 74-95 mph (NOAA, 2018). Well-constructed frame houses could have damage to roof, shingles, vinyl siding and gutters (NOAA, 2018). Large branches of trees will snap, and extensive damage to power lines and poles will result in power outages for a few or several days (NOAA, 2018).
- Category 2 hurricane - Extremely dangerous winds will cause extensive damage due to wind speeds of 96-110 mph (NOAA, 2018). Well-constructed frame houses could sustain major roof and sliding damage; many shallowly rooted trees will be snapped or uprooted; near-total power loss is expected with outages that could last days or weeks (NOAA, 2018).
- Category 3 hurricane - Devastating damage will occur due to wind speeds of 111-129 mph (NOAA, 2018). Well-built framed houses may incur major damage; many trees will be snapped and uprooted; electricity and water will be unavailable for several days after the storm passes (NOAA, 2018).

- Category 4 hurricane - Catastrophic damage will occur due to wind speeds of 130-156 mph (NOAA, 2018). Well-built framed homes can sustain severe damage; most trees will be snapped or uprooted; residential areas will be isolated due to fallen trees or power lines; power outages will range from weeks to months, most of the area will be uninhabitable for weeks to months (NOAA, 2018).
- Category 5 hurricane - Catastrophic damage will occur due to wind speeds of 157 mph or higher (NOAA, 2018). A high percentage of framed homes will be destroyed; power outages will range from weeks to months; most of the area will be uninhabitable from weeks to months (NOAA, 2018).

Florida Agriculture Extension - Florida Extension services include classes, computer networking, consultations, demonstrations, educational materials, field days, and workshops (UFIAS, 2018). Florida Extension offers online resources such as Distance Diagnostic & Identification System (DDIS), disaster relief handbook, Electronic Data Information Source (EDIS), products for-sale, insect software, and how to transition into a green lifestyle (UFIAS, 2018).

Texas A&M AgriLife Extension Service - An education agency with a statewide network of professional educators, trained volunteers, and county officers. The primary purpose is to address local needs within each community. There is at least one extension agent serving each county in Texas. Primary areas of focus are reducing drought impacts, water conservation, production agriculture, emergency management, food

security, human health, disease prevention and management (Texas A&M AgriLife Extension, 2018).

Limitations

Limitations for the study include the participants of the survey who were targeted populations in three different states. Data collected from the surveys were self-reported with limited questions and focus of data. In addition, every county is different based on population and funding; therefore, resource allocation and extension professional focus will vary on a situational basis.

Significance of Study

The role of extension continues to expand on a national level as natural disasters continue to occur. It is important to evaluate the current roles of extension personnel through their experience in training, communication with elected officials, and communication with other agencies and community members during and after the natural disaster. It is also important to address the personal and professional needs of extension personnel to best assist them fill their role. Understanding the changing role in extension professionals and analyzing policies that will affect the agency will assist in preparing agents in preparing and responding to future natural disasters.

CHAPTER II

LITERATURE REVIEW

Emergency Management Literature

Perry (2007) described disasters from three formal definitions published in the 1950s. The first definition was attributed to Wallace in 1956 who characterized natural disasters broadly as situations that are an "interruption of normally effective procedures for reducing certain tensions, together with a dramatic increase in tensions" (Perry, 2007, p. 6). In 1954, Killian argued that disasters disrupt the social order of an everyday lifestyle due to physical destruction and death that causes people to depart from the pattern of normal expectations (Perry, 2007). In 1958, Moore emphasized that a defining feature of disasters is that people adopt a new behavioral pattern, and "the loss of life is an essential element" (Perry, 2007, p. 6). These definitions parallel with one another because each characterizes disasters as directly impacting the social order with interrupted stability, followed by adaptation, and then a resumption of life order in a stable period (Perry, 2007).

Disasters are characterized as a social disruption that is initiated in the social structure and may be remediated through social structural manipulations (Perry, 2007). Disasters stem not only from the factor that causes the disruption, but also from the rift between social structure norms and values (Perry, 2007). Perry (2007) provided over three dozen definitions of disaster and infers from some of these definitions that the magnitude of a disaster should not be measured in lives or property lost, but by the extent of the failure of the cultural or normative system.

Another common theme amongst communities who have faced disasters was the measurement of resiliency (Perry, 2007). Perry (2007) concluded that some authors narrate disasters as social problems, but there is a general consensus that disasters are understood best when placed in a context of social change. Although there are common themes amongst current measurement of disasters, there are disagreements about how disasters should be studied such as definitions from different groups, the nature of social science, and disciplinary differences such as the distinction between hazards and disasters (Perry, 2007).

From a practical standpoint, it is imperative to understand local emergency management organizations because the burden of mitigating disasters falls intensely at the community level (McEntire, 2007). For example, when the World Trade Center towers collapsed in September 2001, hundreds of government agencies and departments shifted their resources and attention to New York (McEntire, 2007). Some of the individuals and organizations involved were search and rescue teams, law enforcement, environmental enforcement officials, intelligence agents, congressional representatives, the National Guard, interstate mutual aid partners, and the Federal Emergency Management Agency (FEMA; McEntire, 2007). Emergent groups, religious organizations, businesses, and nonprofit agencies were also reported to arrive to provide support and various kinds of disaster assistance (McEntire, 2007).

As a result of various stakeholders that are involved in disasters, it is critical that local emergency management organizations are understood due to the complexity of intertwining resources and agendas. McEntire (2007), drew on Hoetmer's (1991)

definition, and described emergency management as "the definition and profession of applying science, technology, planning and management to deal with extreme events that can injure or kill large numbers of people, do extensive damage to property, and disrupt community life" (p. 169). Building from Hoetmer's definition, McEntire (2007) described emergency managers as public servants who employ knowledge, techniques, strategies, tools, organizational networks, and community resources to successfully protect people, property, and the environment from disasters.

Extension plays a significant role in enabling families, communities, and businesses to successfully respond to critical incidents such as natural disasters (Boteler, 2007). Extension can be involved in all aspects of managing an incident from a natural disaster such as prevention, mitigation, preparedness, response, and recovery (Smith, Black, & Williams, 2012). In addition, there are other fields that have extension, such as the Texas A&M Engineering Extension Service (TEEX), which has training for emergency response. TEEX's major programs are fire and rescue, infrastructure and safety, law enforcement, economic and workforce development, and homeland security (TEEX, n.d.).

TEEX focuses specifically on prevention and response in collaboration with partnering agencies to create increased fire safety and emergency response, cleaner drinking water, better roads and infrastructure, improved homeland security, leadership training, heightened public safety, and new approaches to improving cybersecurity (TEEX, n.d.). There are similar engineering extension agencies in Kansas and Oklahoma. Extension has traditionally been most involved in preparedness, prevention,

and recovery efforts, which is complementary when partnering with traditional emergency management agencies (Smith et al., 2012). There are other extension agencies that provide simulations to accomplish similar objectives as the evolving roles of agriculture extension personnel.

Local extension personnel often function as a critical levy of communication in rural areas, especially when standard methods of communication are no longer available following a natural disaster (Boteler, 2007). Several Cooperative State Research, Education, and Extension Service (CSREES) programs advance knowledge about disaster preparedness and response to local communities (Boteler, 2007). The Extension Disaster Education Network (EDEN) is known to be a significant information system for sharing disaster preparedness and response information amongst agencies (Boteler, 2007). After reviewing responses to Hurricane Katrina, it was found that Extension agents were closely tied to the state's disaster response team, and as a result, communication flowed much more quickly to affected individuals (Boteler, 2007). Continued research in disaster preparedness will increase Extension professionals' knowledge of rural community vulnerabilities, increase capacity to respond to disasters, and develop systems to help rural governments, communities, families, and businesses become resilient (Boteler, 2007).

Extension professionals' participation in natural disaster exercises are critical to evaluate actual response capacity and identify needs for additional training or equipment (Smith et al., 2012). Extension personnel expand participation in communities by promoting exercises involving agriculture, family, youth, and community development

issues; helping to design, plan, and facilitate exercises; serve as evaluators, simulators, or players in exercises; and encourage involvement of 4-H families and other volunteers to serve as victims during simulations (Smith et al., 2012). Additional roles of Extension personnel in natural disaster preparedness include: networking with state and county or local emergency management and voluntary organizations who are active during disasters; facilitating and conducting training and planning into current programs offered by Extension; facilitating engagement of an internal network of Extension professionals in disaster preparedness; and promoting the role of Extension and resources of EDEN (Smith et al., 2012).

Extension personnel are adapting to their changing environment and the new responsibilities that emerge while preparing and providing disaster relief services. Morse, Brown, and Warning (2006) argued that the role of extension personnel has evolved to meet the complex issues within social, economic, and political environments. Extension programming and leadership has adapted as the agriculture industry and extension has evolved over the last century (Morse et al., 2006). Extension programs provide benefits to enhance the social and physical environment for the general public (Morse et al., 2006). As natural disasters continue to occur, extension programs continue to evolve to meet the needs of local communities.

Professionals are facing a tipping point where they must balance their current roles with the emerging roles in the wake of disasters. Eighmy, Hall, Sahr, Gebeke, and Hvidsten (2012) found that it is critical for county extension staff to establish a relationship with county emergency planning personnel and remain current on county

issues. Given the shifting role of extension personnel, staff should attend emergency planning meetings and know Extension's role in the emergency management plan (Eighmy et al., 2012) at the local, regional, and state level. It is vital for extension personnel to report identified issues and needs to county emergency planers even if extension is not on an Emergency Management Board (Eighmy et al., 2012).

According to Boteler (2007), the Subcommittee on Disaster Reduction of the National Science and Technology Council released a report in 2005 titled the *Grand Challenges for Disaster Reduction*. In their report, the council identified six areas to reduce losses from disasters (Boteler, 2007):

1. Provide hazard and disaster information where and when it is needed by improving data collection, and creating standards for sharing, storing, and analyzing data;
2. Understand the natural processes that produce hazards by improving models and visualization techniques;
3. Develop hazard mitigation strategies and technologies by creating resilient structures and infrastructure systems, support structural advances, and quantify the monetary benefits of disaster mitigation using economic modeling;
4. Recognize and reduce vulnerability of interdependent critical infrastructure by developing technology to prevent cascading failures in public infrastructure systems, and enhancing the ability to protect public health;
5. Assess disaster resilience using standard methods such as: supporting intelligent community and investment strategies and protect natural resources with

comprehensive risk assessments, assess the resilience of the natural and human environment, and learn from each hazard event; and

6. Promote risk-wise behavior by raising public awareness of local hazards, warning people with consistent, accessible, and actionable messages, and develop policies that promote risk-wise behaviors that are rooted in social science research.

CHAPTER III

CONTENT ANALYSIS METHOD

Summary

The purpose of this study was to describe the current roles of extension personnel through their experience from trainings, communication with elected officials, and communication with other agencies and members within the community during and after natural disasters. Further, the purpose of this study addresses the personal and professional needs of extension personnel to best assist them in their role. Understanding the changing role of extension personnel and analyzing policies that may affect agencies will assist agents in preparing and responding to future natural disasters.

Ideally, researchers and/or evaluators would invest months before, during, and after natural disasters documenting the work of first responders, policy makers, emergency managers and extension personnel. This type of expansive approach could provide the most accurate and potentially useful description of evaluating the changing roles of extension personnel. However, to accomplish such an undertaking, there needs to be a series of smaller case studies to understand the underpinnings of evaluating the current roles of Extension personnel though their experience from trainings, communication with elected officials, and communication with other agencies and members within the community during and after natural disasters.

Although many accounts of natural disaster impacts on structures, livelihoods, and cost associated with the incident are evident in government reports (e.g., Blake & Zelinsky, 2018; Cangialosi et al., 2018; CDC, 2018; NOAA, 2018), in several notable

authorities' publications (e.g., McEntire, 2007; Morse et al., 2006), and fewer academic publications (e.g., Boteler, 2007; Perry, 2007), there is little empirical evidence to guide an expansive research endeavor. Therefore, the purpose of this thesis was to describe accounts of extension personnel's changing roles through their experiences from trainings, communication with local officials, and communication with other agencies in multiple case studies in recent natural disasters in the US. This study seeks to address the personal and professional needs of extension personnel amidst hurricanes and wildfires. Although useful, the multiple case study approach to this study must be limited to the unique, time-bound, and accessible cases described in this study.

To address the research questions and respective objectives of this study, data were obtained from independent evaluation efforts conducted by evaluators in Texas A&M AgriLife Extension Service's Organizational Development Unit and evaluators in The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) Extension Service. Data used for this study were obtained as secondary source data after the evaluation efforts were concluded by the evaluation teams. Therefore, this study was an account of three cross-sectional case studies of natural disasters that occurred between February 2018 and November 2018 in the US. Sources of case data included survey responses of 200 extension personnel in Florida and Texas collected between February 2018 and November 2018.

Bryman (2016) defined a case study as an association with a location, such as a community or organization, where the emphasis is upon an intensive examination of the setting. Case study research is concerned with the complexity and specific nature of the

case in question (Stake, 1995). An idiographic approach was taken, where the unique features of the case are illustrated (Bryman, 2016). Each case had unique circumstances and varying methods of collecting data, response rates, and limitations. Bryman (2016) noted that cross-sectional case studies include a sample of cases to provide variation and that it is only possible to examine relationships between variables. Therefore, each case was described individually.

First, the extension personnel included in each case were described. Then, a summary of the circumstances of each case was presented. These circumstances are within the description of the natural disasters described in Chapter 1. However, the cases included in this study are more narrowly focused on the roles and circumstances of extension personnel in each incident. Therefore, the descriptions included in this study may differ from incidents that occur in different times and places. Further, the cases described in this study must be limited to the individuals who provided information about the disaster, time, and circumstances they experienced.

Cases

In the case of Hurricane Irma, in Florida, IFAS Extension personnel were surveyed about professional needs, personal needs, communication, technology, organizational coordination, training, and resources.

In the case of Hurricane Harvey, in Texas, Texas A&M AgriLife Extension Service personnel were surveyed about damage in their county, the time it took to connect with local officials, reporting, communication amongst different levels of extension, and training.

In the case of the Texas Panhandle fires, in Texas, Texas A&M AgriLife Extension Service personnel were surveyed about professional needs, damage in their county, the time it took to connect with local officials, communication, and training.

Extension personnel's personal needs, professional needs, methods of communication, technology used, organizational coordination, access to resources, impact in the community, and assessment of damage in their area were described and/or used as the dependent variables. The independent variables were the state (Texas or Florida) and the type of disaster (hurricane or wildfire).

Participant Characteristics

Data included in this study were collected from extension personnel in Texas and Florida between March and November 2018. After two points of contact for Hurricane Harvey and one point of contact for Texas Panhandle and Hurricane Irma, 200 responses were deemed usable.

Hurricane Harvey

A subgroup of extension personnel (n = 28) provided responses for this case. One-half of respondents (n = 14, 50%) reported agriculture and natural resources as their primary subject area. The second highest primary subject area was family and consumer health (n = 8, 28.6%). The remaining 21.4% was evenly divided between 4-H (n = 3, 10.7%) and other (n = 3, 10.7%). Responses selected as other included coastal and marine (n = 1, 3.57%), middle manager (n = 1, 3.57%), and a combined job description between agriculture and natural resources and 4-H (n = 1, 3.57%). Responses from all 28

respondents stated that the minimum amount of time they have worked with Extension is one year with a maximum of 31 years, generating a mean of 13.29 (*SD* = 8.84). Survey participants were not forced to provide a response for each question (Qualtrics survey option of force response). Therefore, not all respondents indicated their level of service or area of specialization.

Texas Panhandle

A subgroup of extension personnel (*n* = 45) provided responses for the district they represented. The plurality of respondents (*n* = 16, 36%) of respondents were representatives from District 5 (*n* = 8, 18%) and District 13 (*n* = 8, 18%). The remaining respondents represented District 10 (*n* = 7, 16%), District 14 (*n* = 7, 16%), District 11 (*n* = 5, 11%), District 15 (*n* = 15, 11%), District 7 (*n* = 2, 4%), District 9 (*n* = 2, 4%), and District 6 (*n* = 1, 2%).

A subgroup of extension personnel (*n* = 32) provided responses for their primary subject area. The majority (*n* = 29, 91%) of respondents' primary subject area was agriculture and natural resources. No one reported their primary subject area as family and consumer sciences. A respondent reported their primary subject area as 4-H (*n* = 1, 3%). Responses selected as other included horticulture (*n* = 1, 3%) and agriculture education (*n* = 1, 3%).

A subgroup of extension personnel (*n* = 30) provided responses for the amount of time they have worked with Extension. The minimum amount of time they have worked with Extension was one year with a maximum of 32 years, and an associated mean of 14.3 years (*SD* = 9.5). Survey participants were not forced to provide a response for each

question (Qualtrics survey option of force response). Therefore, not all respondents indicated the district they represented, area of specialization, nor how many years they have worked with Extension.

Hurricane Irma

A subgroup of extension personnel (*n* = 125) provided responses for their rank. The plurality of respondents (*n* = 39, 31%) were Extension Agent II. The remaining respondents were ranked Extension Agent III (*n* = 24, 19%), Extension Agent I (*n* = 23, 18%), Extension Agent IV (*n* = 23, 18%), other (*n* = 9, 7.2%), Extension Program Assistant (*n* = 3, 2.4%), Courtesy Extension Agent IV (*n* = 2, 1.6%), Courtesy Extension Agent I (*n* = 1, .8%), Courtesy Extension Agent III (*n* = 1, .8%), and none as Courtesy Extension Agent II. Responses selected as other included Associate Professor – State Wide Extension Specialist (*n* = 2, 1.6%) and Program Manager (*n* = 4, 3.2%). The remaining three extension personnel who selected other did not report their title.

A subgroup of extension personnel (*n* = 30) provided responses for having administrative responsibilities. The majority of respondents (*n* = 29, 96%) were County Extension Directors. The minority (*n* = 1, 4%) was a District Extension Director.

A subgroup of extension personnel (*n* = 115) provided responses for how many years of experience they had with the Cooperative Extension Service in Florida. The minimum was half a year, the maximum was 35 years, and the mean was 11.7 years (*SD* = 8.5). A subgroup of extension personnel (*n* = 22) provided responses for how many years of experience they had with Cooperative Extension Service outside of Florida. The minimum was one year, the maximum was 23 years, and the mean was 8.3 (*SD* = 6.1).

A subgroup of extension personnel (n = 113) provided responses for their primary subject area. The plurality of respondents (n = 34, 30%) reported their primary program area as agriculture. The remaining responses consisted of other (n = 23, 20.3%), 4-H/Youth development (n = 17, 15%), family resources (n = 16, 14%), lawn and garden (n = 13, 11.5%), natural resources (n = 10, 8.8%), and none selected learning opportunities. Responses selected as other included horticulture (n = 4, 19.7%), community development (n = 6, 29.5%), local food systems (n = 1, 4.9%), family and consumer sciences (n = 3, 14.7%), health and nutrition (n = 2, 9.8%), expanded food and nutrition education program (n = 1, 4.9%), urban pest management (n = 1, 4.9%), and economic resources (n = 1, 4.9%). The remaining four who selected other did not report their primary program area.

A subgroup of extension personnel (n = 103) provided responses for reporting their age ranging from 17 to 100. Responses were reduced (n = 93) due to respondents reporting their age below 17. The minimum age was 18 the maximum age was 54 and the mean was 35.3 (SD = 10.1). In addition, a subgroup of extension personnel (n = 114) reported their gender. The majority reported female (n = 73, 64%). The minority reported male (n = 41, 36%).

A subgroup of extension personnel (n = 113) reported their ethnicity. The majority of respondents (n = 97, 85.8%) reported themselves as White, Non-Hispanic. The remaining responses consisted of Hispanic/Latino (n = 9, 8%), African-American (n = 5, 4.4%), Asian-American (n = 1, .9%), and Native-American (n =1, .9%). There were no respondents who reported themselves in the other category.

Survey participants were not forced to provide a response for each question (Qualtrics survey option of force response). Therefore, not all respondents indicated their Extension rank, administrative responsibilities, years of experience in Florida and out of Florida, primary program area, age, gender, and ethnicity.

Instrumentation

All surveys were distributed through Qualtrics with a total of 29 questions for Hurricane Harvey, 39 questions for Texas Panhandle, and 55 questions for Hurricane Irma. Separate versions were sent to each state focusing on communication with elected officials, time and resources spent working in their communities, how Extension professionals' roles would alter or remain the same in future emergency management incidences, training to manage and report their efforts, and agents' personal satisfaction with the efforts. The surveys varied between the incidents because questions were directed to the separate natural disasters of the hurricanes or the wildfires.

Data were collected through Qualtrics and downloaded using Microsoft Excel. The questions were open ended or close ended. Florida served as the base and responses from Hurricane Harvey and Texas Panhandle were structured around Florida. All three surveys had open-ended and closed-ended questions.

With an open-ended question, respondents may answer the question in their own words by typing their own response (Bryman, 2016). Advantages to open-ended questions are that respondents can answer on their own terms, and they are useful for exploring new areas or ones in which the researcher has limited knowledge (Bryman, 2016). With a close-ended question, respondents are presented with a set of fixed

alternatives from which they must select one of the provided answers (Bryman, 2016). An advantage of close-ended questions is that the comparability of answers is enhanced due to the level of consistency (Bryman, 2016).

The challenges of collecting data through open-ended responses were that I read each response and compile common themes for each response. Some questions were not used for this study because respondents were unclear on how to answer the question or were unsure of the purpose behind the question. However, a disadvantage to close-ended questions is that there could be a better alternative than what is outlined on the list of fixed answers that are provided (Bryman, 2016). Therefore, a response category of '"other" was provided to provide alternative answers on the close-ended questions as needed. The Qualtrics survey responses were recorded anonymously to promote confidentiality and encourage Extension professionals to respond accurately to their experience amidst the natural disaster. A new codebook was built to fit the three different datasets together.

In addition, various forms of validity were analyzed. Face validity reflects the content of the concept in question (Bryman, 2016). Face validity is established by asking those with experience or expertise in a field to determine whether on the face of it the measure seems to reflect the concept concerned (Bryman, 2016). The Qualtrics survey for Hurricane Irma was deemed acceptable by an expert panel that consisted of faculty members with specializations in extension education, community disaster management and recovery, and agricultural communications. The Qualtrics surveys for Hurricane Harvey and the Texas Panhandle Fire were deemed acceptable by faculty members with

specializations in extension education and community disaster management and recovery.

Content validity is the concept of whether the measure actually measures what is being tested (Collins, 2006). Further, content validity focuses on the extent the questions are representative of all the facets seeking to be measured. Content validity is established by showing that the test items are a sample of an area in which the researcher is interested (Messick, 1995). Content validity was addressed by an expert panel at University of Florida for Hurricane Irma, and an expert panel for Hurricane Harvey and Texas Panhandle at Texas A&M University.

In addition, Texas A&M AgriLife Extension and UF/IAS used concurrent validity and construct validity in their survey instruments. Concurrent validity is when the researcher employs a criterion on which cases are known to differ (Bryman, 2016). Differentiation in responses is relevant to the concept in question (Bryman, 2016). An example of concurrent validity is when extension personnel were asked to report their job title and how they particularly made an impact in the community after the natural disaster occurred. Construct validity is when the researcher deduces hypotheses from a theory that is applicable to the concept (Bryman, 2016). For example, in Texas extension personnel were asked to report how much of their job responsibilities were directed to Hurricane Harvey or the wildfires. Extension personnel were also asked if they thought more staff needed to be hired to particularly specialize in natural disaster preparation and mitigation.

All responses were analyzed and reported in the results section. Results were compared amongst Texas and Florida to find common themes and overall areas of improvement to be suggested for natural disaster preparedness.

Hurricane Irma

In March 2018, the University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) developed and implemented an eight-section web-based survey through Qualtrics. The eight-sections encompassed extension personnel's personal needs, professional needs, communication, technology, organizational coordination, resources, impact, and demographics. The entirety of the survey is in Appendix B.

There were 20 open-ended questions and 35 close-ended questions asked for data collection on Hurricane Irma. A five-point, Likert-type sliding scale with bipolar anchors (1 = *Not at All* to 5 = *Great Extent*) was used to measure respondents' agreement with 21 statements. Additionally, there were two yes, no, or maybe questions asked. Respondents were asked to report their Extension rank, if they had administrative responsibilities, the location of the counties they worked in, how many years of experience they had in Florida and outside Florida, their primary program area, age, gender, and ethnicity.

Post hoc estimates of reliability were calculated, using all scaled items in for this instrument and resulted in a Cronbach's Alpha coefficient of .92 (n = 93). The questionnaire was reviewed for face and content validity by an expert panel that consisted of faculty members with specializations in extension education, community

disaster management and recovery, and agricultural communications. The panel deemed the instrument acceptable.

Hurricane Harvey

In March 2018, Texas A&M AgriLife Extension developed and implemented a two-section web-based survey through Qualtrics regarding Hurricane Harvey. The first section included questions regarding personal needs, professional needs, communication, technology, organizational coordination, resources, impact, and damage. The second section asked respondents to report their primary subject area and how long they have worked for the Extension service. The entirety of the survey is in Appendix C.

There were 12 open-ended questions and 17 close-ended questions asked for data collection on Hurricane Harvey. A five-point, Likert-type sliding scale with bipolar anchors (1 = *Strongly Disagree* to 5 = *Strongly Agree*) was used to measure respondents' agreement with three statements. A percentage sliding scale (0 minimum to 100 percent maximum) was used to assess damage in Texas counties. A sliding scale was used to assess extension personnel's time spent completing various tasks. The scales varied among the questionnaire from zero to 100. Also, there were four yes or no questions asked. Respondents were asked to report their primary subject area and how many years they have worked with Extension.

Post hoc estimates of reliability were calculated, using all scaled items in for this instrument and resulted in a Cronbach's Alpha coefficient of .87 (n = 28). The questionnaire was reviewed for face and content validity by an expert panel that

consisted of faculty members with specializations in extension education and community disaster management and recovery. The experts deemed the instrument acceptable.

Texas Panhandle

In October 2018, Texas A&M AgriLife Extension personnel developed and implemented a three-section web-based survey through Qualtrics regarding the Panhandle fires of 2017. The first section included one demographic question asking extension personnel to report what district they represent. The second section included various questions regarding personal needs, professional needs, communication, technology, organizational coordination, resources, impact, and damage. The third section asked respondents to report their primary subject area and how many years they have been with Extension. The entirety of the survey is in Appendix D.

There were 20 open-ended questions and 19 close-ended questions asked for data collection on the Texas Panhandle fires. A five-point, Likert-type sliding scale with bipolar anchors (1 = *Strongly Disagree* to 5 = *Strongly Agree*) was used to measure respondents' agreement with two statements. A sliding scale (0 minimum to 50 maximum) was to assess hours spent on a particular aspect of their position was asked in two question. A sliding scale (0 minimum and 50 maximum) was used to assess extension personnel's time spent completing various tasks. A four-point, Likert-type sliding scale with bipolar anchors (1 = *Not at All* to 4 = *Great Extent*) was used to measure respondents' agreement with three statements. Respondents were asked to report what district they represent, their primary subject area, and how many years they have worked for Extension.

Post hoc estimates of reliability were calculated, using all scaled items in for this instrument and resulted in a Cronbach's Alpha coefficient of .84 (n = 57). The questionnaire was reviewed for face and content validity by an expert panel that consisted of faculty members with specializations in extension education and community disaster management and recovery. The experts deemed the instrument acceptable.

Data Collection

Secondary source data, described in the previous sections, were used for this study. Secondary data is an analysis of data that has been collected by other researchers (Bryman, 2016). Data for Hurricane Harvey and the Texas Panhandle fires were collected by Texas A&M AgriLife Extension Organizational Development Unit. Data for Hurricane Irma was collected by Florida Agriculture Extension. Sorensen, Sabroe, and Olsen (1996) claimed that secondary data is major advantage to use existing data sources, with large quantities of information, which are easily available for research purposes. Another advantage of using secondary data is that it may offer new interpretations, where a secondary analyst may decide to consider the impact of certain variables on the relationships between variables of interest (Bryman, 2016).

In addition, an alternative method of quantitative data analysis may be utilized, which offers different possibilities of interpreting the data (Bryman, 2016). It is critical that existing documentation is reviewed to assess the appropriateness of the data for the researcher's intended purpose (Sorensen et al., 1996). If such documentation does not exist, researchers must evaluate the data source by methods of protocols, record layout

codes, data entry instructions, published material, analyses, technical reports, and appropriate completeness and validity studies (Sorensen et al., 1996).

The Office of Management and Budget (OMB, 2006) published the *Standards and Guidelines for Statistical Surveys*, which included federal guidelines for conducting survey research. Where possible, I followed or addressed the guidelines in relation to the methods used to collect data for this study. However, because the data reported in this study were collected during times of recovery and by extension service administrators, not all standards and guidelines were feasible or practical.

According to the OMB (2006) standards and guidelines, surveys must be designed to achieve the highest practical rates of response, commensurate with the importance of survey uses, respondent burden, and data collection costs. These standards are required to verify that survey results are representative of the target population to be used with confidence and make informative, data-based decisions (OMB, 2006). Agencies must ensure the scope for the sample survey are appropriate for the study design and are evaluated against the target population for quality analysis (OMB, 2006).

Surveys must be designed and administered in a manner that achieves a balance between maximizing data quality and controlling measurement error while minimizing respondent burden and cost (OMB, 2006). Dillman, Smyth, and Christian (2009) defined nonresponse error as not getting everyone who is sampled to respond or complete the survey request. Nonresponse bias analysis must be performed upon the suggestion that unit or item response rates have the potential for bias (OMB, 2006). Measurement error is reduced by using items that are valid, reliable, and unambiguous to the research

participants (Linder, Murphy, & Briers, 2001). Furthermore, agencies must measure, adjust for, report, and analyze unit and item nonresponse to assess their effects on data quality and for the purpose of informing users (OMB, 2006). Response rates must be calculated using standard formulas to measure the proportion of the qualifying sample that is represented by the responding units within the study, which indicates a potential for nonresponse bias (OMB, 2006).

To ensure that the survey can be replicated and evaluated, the following steps were consulted from OMB (2006), *Standards and Guidelines for Statistical Surveys*:

1. Survey planning and design decisions;
2. Selected sample;
3. Sampling frame;
4. Justifications for the items on the survey instrument, including why the final items were selected;
5. All instructions to respondents about how to properly respond to a survey item;
6. Description of data collection methodology;
7. Data editing plan specifications and justifications;
8. Analysis plans; and
9. Documentation made publicly available in conjunction with the release of data.

An explanation of the study was sent to extension personnel by the University of Florida Institute of Food and Agricultural Sciences Extension throughout the state for

Hurricane Irma. For Hurricane Harvey and Texas Panhandle an explanation of the study was sent to extension personnel by members of the Texas A&M AgriLife Extension Service's Organizational Development Unit in the affected regions rather than the entire state of Texas. Extension personnel in Texas were encouraged to distribute the survey to other extension personnel, generating a higher response rate than was initially expected for Hurricane Harvey.

The accuracy and inclusiveness of the lists obtained was unknown. It was not reasonably possible to access and accurate frame of extension personnel for Texas and Florida or determine the extent of the frame error. Collecting data in these areas can arguably be somewhat representative of the population of the extension personnel in the selected states and regions. However, there is no probabilistic way of calculating the margin of sampling error. It is important to note that thought the approach to this study provided the opportunity for large data to be collected, the numerous sources of data and variation of methods pose a threat to the external validity to this study due to the concern of unknown error.

Hurricane Harvey

A pilot test for the survey was conducted beginning February 27, 2018 and ending March 5, 2018, to a group of about 10 graduate student researchers and extension leadership experts at Texas A&M University. The pilot test accounted for content accuracy and reliability. Piloting is used to ensure the survey questions are clear and ensures that the research instrument as a whole is high functioning (Bryman, 2016). A reliability coefficient on the pilot test for Hurricane Harvey was not calculated.

Adjustments were made to the items included in the questionnaire, based on feedback from the pilot study.

Ideally, the procedures described in Dillman's *Tailored Design Method* (Dillman et al., 2009) would have been implemented, including five points of contact, incentives, and multiple modes of contact. However, the constraints of the project did not allow for Dillman et al.'s (2009) recommendations to be implemented. Additionally, estimates of internal and external error were not calculated due to the small sample (internal error) and lack of a sampling frame (external error).

To conduct the evaluation, a link to a Qualtrics survey was emailed to extension professionals on March 7, 2018. Extension professionals completed the questionnaire electronically through computer or mobile device. An email reminder asking extension professionals to complete questionnaire was distributed once more on March 14, 2018 to remind extension professionals to participate. Data collection concluded on March 26, 2018. There was no incentive used in the study.

Initially 42 emails invitations were sent to recruit participants. At the conclusion of data collection efforts for this case, 48 completed questionnaires were received. More questionnaires were completed than the number of requests sent because extension professionals were encouraged to distribute the survey to their colleagues. There were 29 surveys were deemed usable for analysis.

Texas Panhandle Fires

To conduct the evaluation, a link to a Qualtrics survey was emailed to Extension professionals on October 25, 2018 and concluded on November 16, 2018. Extension

professionals completed the questionnaire electronically through computer or mobile device. Initially, 200 emails were sent to recruit participants. A total of 95 surveys were received for a 47.5% response rate. There were 34 surveys deemed usable for analysis. There was no incentive used in the study. Ideally, Dillman's *Tailored Design Method* (Dillman et al., 2009) would have been implemented. However, the constraints of the project did not allow for Dillman et al.'s (2009) recommendations to be applied.

Hurricane Irma

A questionnaire developed by UF/IFAS for the 2004 hurricane season was modified to include additional questions to identify Extension's role in Hurricane Irma preparation and recovery and used as an instrument for the study that was conducted in 2017. The survey was created and distributed in October 2017 by Florida Extension. The targeted population for the study was all Florida Extension faculty (i.e., Extension agents, and county and district professionals). A link to the online questionnaire was distributed using Qualtrics to all Florida Extension faculty who had viable email addresses at the time of data collection (n = 358). Four reminder emails were sent weekly following the initial email invitation. There were 137 usable responses collected from 137 of the 358 faculty for a 38% response rate.

Due to a low response rate, agencies must measure, adjust for, report, and analyze unit and item nonresponse to assess their effects on data quality and for the purpose of informing users (OMB, 2006). These measures were not available. Therefore, sampling error was a concern, because it is nearly impossible to determine whether differences are present between the population and the sample population (Bryman,

2016). The sample population may not have been representative of the larger population's attitudes or patterns of behavior (Bryman, 2016).

Analysis of Data

Datasets in the form of SPSS or Excel spreadsheets were received from evaluators in Texas A&M AgriLife Extension Service's Organizational Development Unit and from evaluators in The University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) Extension Service. A visual representation of the workflow process is in Appendix E. Because these data were collected for independent evaluation efforts of each event and conducted by different evaluation teams, the datasets could not be directly merged. Therefore, extensive recoding was needed to connect the datasets in a useable form.

Data were recoded amongst common themes found in the responses of Extension personnel. Data were analyzed and described by the natural disaster by state and incident. For ease of understanding, the analyses were presented individually by research objective under each research question for this section. Variable names, types, and values can be found in the data coding sheet (Appendix A). After completion of recoding, all data were analyzed using SPSS. Descriptive statistics, including frequency and percentage, were reported for nominal- and ordinal-level data. Mean, standard deviation, minimum, and maximum were reported for interval-level data. Cronbach's Alpha coefficients, when available, were reported as an indication of the reliability of measures. Reliability is the concept of whether the results of the study are repeatable

(Bryman, 2016). Validity is the integrity of the conclusions that are gathered from the research conducted (Bryman, 2016).

Variable Recodes

According to the OMB (2006) standards and guidelines, data coding was defined as converting information and symbols to be easily counted and tabulated. Agencies must add codes to collect data to identify aspects of data quality from the collection for data to be appropriately analyzed (OMB, 2006). Coding was necessary to convert information collected as text into a form that permits immediate analysis as a method of enhancing comparability (OMB, 2006).

Prior to performing formal analysis, a series of data recodes, and variable recodes were necessary due to the variation of questions among the surveys. Coding is a starting point for many types of data analysis (Bryman, 2016). To ensure that the codebook can be replicated and evaluated, the following steps were consulted from Newton and Rudestam (1999):

1. *Variable Description*: A brief description of the variable that enables researchers to readily identify the questionnaire item;
2. *Variable Name*: Adopted from the specifications of the SPSS, which limits variable names, with no blank spaces between the characters;
3. *Value Labels*: The names of the response categories and their respective codes;
4. *Cell/Column Number*: These combinations form "cells" that define the location of a variable of any size, for any case.

To describe common themes among extension personnel, open-ended responses were coded. The following steps were consulted from Newton and Rudestam (1999):

1. All the responses were recoded to determine common themes;
2. Additional codes were assigned to the new categories;
3. Finally, return to the questionnaire and record the appropriate code for the "Other" category.

A coding schedule was created to simplify the large scale of data to "facilitate the discussion of the principles of coding in content analysis and of the construction of a coding schedule" (Bryman, 2016, p. 293). The coding schedule can be referenced at http://bit.ly/Myers_CodeBook. A coding manual was also created to provide a complete listing of all categories for each dimension that is coded (Bryman, 2016). Upon creating a manual coding process to convert text to numeric codes, creating a quality assurance process to verify a sample of the coding to was used to maintain coding access (OMB, 2006). The coding manual can be referenced at http://bit.ly/Myers_CodeBook.

Analyses

For each research question, I used research objectives to divide the analyses and results into sub-sections to maximize clarity. Because the questionnaires used after each natural disaster differed to varying degrees, it was necessary to recode responses into categories that were inclusive of all responses, as described in the previous section and described in entirety in Appendix A. Therefore, I analyzed and reported the recoded

variables for each research objective. For each objective, I reported results in aggregate (total) and disaggregate (divided by state and incident type).

RQ1

I used two research objectives to describe extension professionals' personal and occupational needs. For RO1.1, I calculated and reported frequencies and percentages for eight recoded variables; including five dichotomous variables (*Not at all* and *Slight or greater*) to describe the levels of damage, stress, emotions, and need experienced after the natural disasters; and three nominal variables to describe sources of support that were available to extension professionals after the natural disasters. For RO1.2, I calculated and reported frequencies and percentages for 54 recoded variables; including 37 dichotomous variables (*Not at all* and *Slight or greater*) to describe the levels of stress, emotions, professional development, and availability to attend trainings after the natural disasters; and 17 nominal variables to describe resource accessibility, access to Extension website, and training improvements.

RQ2

I described communication channels used by extension personnel amidst natural disasters. I calculated and reported frequencies and percentages for 50 recoded variables; including 38 dichotomous variables (*Not at all* and *Slight or greater*, and Yes or No) to describe methods of communication used such as flyers, radio announcements, television, internet, and various social media platforms; and 12 nominal variables to describe what messages extension personnel were trying to distribute to the public, plans

of action, information communicated by elected officials, and information communicated by community members.

RQ3

I described forms of technology that is used by extension personnel amidst natural disasters. I calculated and reported frequencies and percentages for 18 recoded variables; including one dichotomous variable (Yes or No) to describe if extension personnel personally lost cellular service; and 17 nominal variables to describe the different forms of technology used and if their level of accessibility.

RQ4

I used three research objectives to describe educational programs currently utilized, program effectiveness, and suggestions for future programs. For RO4.1, I calculated and reported frequencies and percentages for five recoded variables; including five dichotomous variables (*Not at all* and *Slight or greater*, and Yes or No) to describe if educational programs were conducted at the county, district, and state level, and if Extension is involved in the community's emergency response action plan. For RO4.2, I calculated and reported frequencies and percentages for three recoded variables; including three dichotomous variables (*Not at all* and *Slight or greater*) to describe extension's educational program effectiveness amidst natural disasters at the county, district, and state level. For RO4.3, I calculated and reported frequencies and percentages for three recoded variables; including three nominal variables to describe improving educational programs before and after natural disasters.

RQ5

I described the local, state, and federal agencies that were accessed or contacted before, during, and after natural disasters. I calculated and reported frequencies and percentages for 50 recoded variables; including 35 dichotomous variables (*Not at all* and *Slight or greater*, and Yes or No) to describe which local, state, and federal agencies were utilized; and one nominal variable to describe why extension personnel had not previously expanded their list of contacts. I also calculated and reported the mean, standard deviation, minimum, and maximum for 10 recoded variables to describe time spent prior and time spent after the natural disaster extension personnel connected with various stakeholders, reported data, and dealt with issues outside normal content areas.

RQ6

I described the impact extension personnel made in local communities after the natural disaster occurred. I calculated and reported frequencies and percentages for four nominal variables to describe the successes and challenges extension personnel experienced within the communities.

RQ7

I described the damage assessed in local communities after the natural disaster occurred. I calculated and reported frequencies and percentages for seven recoded variables; including two nominal variables to describe the main source of damage and a brief description of the damage. I also calculated and reported mean, standard deviation, minimum, and maximum for five recoded variables to describe percentage of the county

damaged, and how much time was allotted toward natural disaster response at various points after the disaster occurred.

CHAPTER IV

FINDINGS

Summary

The purpose of this study was to describe the roles of extension personnel through their experience from trainings, communication with elected officials, and communication with other agencies and members within the community during and after natural disasters. Furthermore, the purpose of this study addressed the personal and professional needs of extension personnel to best assist them in their roles. Understanding the changing role of extension personnel and analyzing policies that will affect the agency will assist agents in preparing and responding to future natural disasters.

Surveys were distributed through Qualtrics with a total of 29 questions for Hurricane Harvey, 39 questions for Texas Panhandle, and 55 questions for Hurricane Irma. Separate versions of the survey were sent based on the incident with a focus on communication with elected officials, time and resources spent working in their communities, how extension professionals' roles would alter or remain the same in future emergency management incidences, training to manage and report their efforts, and agents' personal satisfaction with the efforts taken during and after the disaster. The surveys varied between the states and incidents because questions were focused on the unique natural disasters of the respective hurricane or wildfire. Due to the variation in the three surveys, extensive recoding was done to generate common themes amongst the

responses. After completion of recoding, all data were analyzed using SPSS. Data in this study were analyzed and described by the natural disaster by state and incident.

The research questions, specifics of the distribution methods, questionnaire design and content, population, and sample for the quantitative questionnaire were described in chapter three. The results of data for this study were presented in seven parts, by research question.

It is important to note that survey participants were not forced to provide a response for each question (Qualtrics survey option of force response). Therefore, there were answers omitted from tables because of missing data due to lack of responses. There were eight variables (J006_30, J006_45, J006_46, J006_47, J006_48, J006_49, J009_03, J009_07 – see Appendix A) missing due to recoding human-caused errors. There were 13 missing cases (J003_39, J003_56, J005_12, J006_10, J006_11, J006_53, J007_03, J008_04, J008_05, J008_06, J008_14, J008_16RC4, J009_02 – see Appendix A) due to too many missing variables.

Research Questions

RQ1. What were the personal and occupational needs of extension personnel after natural disasters?

RO1.1. Describe extension professionals' personal needs.

In Table 1, descriptive statistics (frequency and percent) were reported to describe the physical damage or emotional stress extension personnel experienced (J001_01 through J001_08RC4). In all three cases, respondents reported damage to their home or other personal hardships; 97 respondents in Hurricane Irma (71.3%), 16

respondents in Hurricane Harvey (66.7%), and seven respondents in Panhandle fires (41.2%).

The remaining questions (J001_02 through J001_08RC4) were asked to Florida extension personnel. Hurricane Irma respondents indicated most frequently that they turned to their family to support their emotional needs (n = 77, 100.0%). In addition, extension personnel indicated that they turned to their family the most to support their physical needs (n = 59, 100.0%). The primary additional comment indicated by extension personnel is that there was a lack of resources during the 2017 hurricane season (n = 11, 100.0%). Descriptive results for all responses were included in http://bit.ly/Myers_ThesisTables.

RO1.2. Describe extension professionals' occupational needs.

In Table 2, descriptive statistics (frequency and percentage) were reported to describe the professional challenges Florida extension personnel faced personally upon assisting clientele (J002_02 through J002_08RC6). The greatest professional challenge reported was creating a work-life balance amidst Hurricane Irma (n = 31, 100.0%). The least professional challenge was not having access to internet (n = 2, 100.0%).

The greatest challenge within a work-life balance was extension personnel being able to take care of family (n = 23, 100.0%). The challenge reported the least within a work- life balance was extension personnel being able to get to the office (n = 3, 100%). Extension personnel reported they were prepared to address the professional challenges they faced during the 2017 hurricane season (n = 128, 93.4%). Extension personnel reported that they were best able to respond to the needs of their clientele by listening (n

= 27, 100%). The method used the least in the aftermath of Hurricane Irma were site visits (n = 6, 100%). Descriptive results for all responses are presented in http://bit.ly/Myers_ThesisTables.

In Table 3, descriptive statistics (frequency and percentage) were reported to describe the professional development Florida extension personnel believed they need to prepare for future hurricanes (J002_09 through J002_16). More people reported a need for helping clientele cope with stress (n = 108, 80%) and hurricane disaster recovery (n = 106, 78.5%) than all other available options. Descriptive results for all responses were presented in Table 3.

Table 3.
Extent professional development is needed in preparation to hurricanes

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Working with the media	135	87	64.4	135	87	64.4	--	--	--	--	--	--
Coping with personal stress	135	76	56.3	135	76	56.3	--	--	--	--	--	--
Helping coworkers cope with stress	135	98	72.6	135	98	72.6	--	--	--	--	--	--
Helping clientele cope with stress	135	108	80.0	135	108	80.0	--	--	--	--	--	--
Personal needs (emotional and physical needs)	135	71	52.6	135	71	52.6	--	--	--	--	--	--
Hurricane disaster preparedness	135	94	69.6	135	94	69.6	--	--	--	--	--	--
Hurricane disaster recovery	135	106	78.5	135	106	78.5	--	--	--	--	--	--
Applying my subject matter in disaster situations	134	95	70.9	134	95	70.9	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 4, descriptive statistics (frequency and percentage) were reported to describe the professional development needed for other natural disasters such as sink-holes, tornadoes, oil-spills (J002_19 through J002_26). Extension personnel in Florida reported the greatest need in helping clientele cope with stress (n = 101, 76.5%). Whereas, extension personnel in the Texas Panhandle reported the greatest need in wildfire disaster preparedness (n = 16, 72.7%) and wildfire disaster recovery (n = 16, 72.7%). Descriptive results for all responses were presented in Table 4.

Table 4.
Extent professional development is needed in relation to other natural disasters

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Working with media	155	105	67.7	134	95	70.9	--	--	--	21	10	46.5
Coping with personal stress	155	83	53.5	134	69	51.5	--	--	--	21	14	66.7
Helping coworkers cope with stress	155	100	64.5	134	86	64.2	--	--	--	21	14	66.7
Helping clientele cope with stress	153	115	75.2	132	101	76.5	--	--	--	21	14	66.7
Personal needs (emotional and physical needs)	154	84	54.5	133	73	54.9	--	--	--	21	11	52.4
Hurricane/wildfire disaster preparedness	152	106	69.7	130	90	69.2	--	--	--	22	16	72.7
Hurricane/wildfire disaster recovery	152	113	74.3	130	97	74.6	--	--	--	22	16	72.7
Applying my subject matter in disaster situations	151	103	68.2	130	89	68.5	--	--	--	21	14	66.7

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 5 descriptive statistics (frequency and percentage) were reported to describe the likelihood extension personnel in Florida and Texas Panhandle would attend professional development conferences related to hurricane preparation (J002_29 through J002_36). Extension personnel in Florida reported that they would prefer to attend a district meeting (n = 121, 89.6%). Respondents also reported that they would prefer to receive print materials as part of their conference participation (n = 120, 88.9%).

Extension personnel in Texas Panhandle responded that they would prefer to attend a district meeting (n = 20, 95.2%). Respondents reported they would prefer to receive print material as part of their conference participation (n = 19, 95%). Descriptive results for all responses were presented in Table 5.

Table 5.

Likelihood to attend conferences related to preparation

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Statewide conference	154	107	69.5	134	96	71.6	--	--	--	20	11	55.0
District meeting	156	141	90.4	135	121	89.6	--	--	--	21	20	95.2
Web-based module/CD-ROM	155	123	79.4	134	105	78.4	--	--	--	21	18	85.7
Telephone conference	154	105	68.2	134	89	66.4	--	--	--	20	16	80.0
Video conference	155	129	83.2	134	112	83.6	--	--	--	21	17	81.0
Print materials	155	139	89.7	135	120	88.9	--	--	--	20	19	95.0
Facebook live	153	95	62.1	134	83	61.9	--	--	--	19	12	63.2
Social media updates	151	110	72.8	132	98	74.2	--	--	--	19	12	63.2

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 6, descriptive statistics (frequency and percentage) were reported to describe the likelihood extension personnel in Florida would attend conferences in preparation for other emergency situations such as sink-holes, tornadoes, and oil spills (J002_37 through J002_44). Extension personnel reported they would attend a district meeting (n = 114, 85.7%) and they prefer print materials to be incorporated into the conference (n = 114, 85.7%). The least preferred method for conference attendance was through Facebook live (n = 73, 56.6%). Descriptive results for all responses were presented in Table 6.

Table 6.

Likelihood to attend conferences in preparation for other emergency situations

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Statewide conference	132	84	63.6	132	84	63.6	--	--	--	--	--	--
District meeting	133	114	85.7	133	114	85.7	--	--	--	--	--	--
Web-based module/CD-ROM	133	99	74.4	133	99	74.4	--	--	--	--	--	--
Telephone conference	131	81	61.8	131	81	61.8	--	--	--	--	--	--
Video conference	132	107	81.1	132	107	81.1	--	--	--	--	--	--
Print material	133	114	85.7	133	114	85.7	--	--	--	--	--	--
Facebook live	129	73	56.6	129	73	56.6	--	--	--	--	--	--
Social media updates	130	92	70.8	130	92	70.8	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 7, descriptive statistics (frequency and percentage) were reported to describe extension personnel's readiness for future hurricanes and wildfires (J002_45RC1 through J002_54RC3). Florida extension personnel indicated a professional need they had during the 2017 hurricane season was knowing where to access information for community members (n = 7, 100%). Texas extension personnel involved in Hurricane Harvey indicated a positive aspect of the training was that trainings took place before the disaster occurred (n = 9, 100%). However, it was also indicated that more trainings were needed (n = 8, 100%).

Extension personnel involved in Hurricane Harvey somewhat agreed their new role amidst after the hurricane can be applicable to other counties (n = 14, 100%). Extension personnel involved in Hurricane Harvey (n = 13, 100%) and Texas Panhandle (n = 10, 100%) agreed the structure extension used for preparing and mitigating damage can be applicable to other emergency responders or other disaster situations. Extension personnel involved in Hurricane Harvey (n = 9, 100%) and Texas Panhandle (n = 10, 100%) agreed they recommend using the same protocol used during the 2017 wildfire and hurricane seasons for future natural disasters.

Extension personnel from Hurricane Harvey (n = 10, 100%) and from Texas Panhandle (n = 12, 100%) neither agree nor disagree this new role can be incorporated in the daily role of a county agent. Respondents involved in Hurricane Harvey indicated they were not prepared to take on their new role with Rebuild Texas (n = 7, 100%).

Respondents from Texas Panhandle neither agreed nor disagreed they were prepared to take on their new role from the 2017 wildfire season (n = 14, 100%).

Extension personnel involved in Hurricane Harvey (n = 12, 100%) and Texas Panhandle (n = 9, 100%) neither agree nor disagree there is a need to assign additional personnel to their county to assist with natural disaster preparation and mitigation. Respondents for Hurricane Harvey (n = 11, 100%) and Panhandle wildfires (n = 8, 100%) somewhat agree future trainings should be performed at the university level for new agents.

The persons who reported for Hurricane Harvey claimed they received training when it was needed (n = 20, 100%). Only one respondent indicated they received wildfire training for the Texas Panhandle fires of 2017. Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

RQ2. What communication channels were being used by extension professionals after natural disasters?

In Table 8, descriptive statistics (frequency and percentage) were reported to describe the methods that extension personnel used media during the 2017 hurricane season in Florida (J003_01 through J003_04). Respondents involved in Hurricane Irma indicated their clientele group was most aware of their efforts through various forms of media (n = 116, 83.5%). Descriptive results for all responses were presented in Table 8.

Table 8.
Extension using media during Hurricane Irma

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Made use of mass media channels to communicate during the recent hurricanes	137	81	59.1	137	81	59.1	--	--	--	--	--	--
Local extension office made use of mass media channels to communicate during the recent hurricanes	134	99	73.9	134	99	73.9	--	--	--	--	--	--
The general public was aware of Extension's efforts during the recent hurricanes	136	107	78.7	136	107	78.7	--	--	--	--	--	--
Extension clientele group was aware of Extension's efforts during the recent hurricanes	136	116	83.5	136	116	83.5	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 9, descriptive statistics (frequency and percentage) were reported to describe the methods of communication extension personnel used in Florida and Texas Panhandle (J003_05 through J003_14RC5). Extension personnel in Florida reported that the greatest method of communication their office used was through the internet (*n* = 125, 94%) followed by flyers and print materials (*n* = 89, 68.5%). Extension personnel in Florida noted that the most effective method of communication to convey information to the public was through an online platform (*n* = 79, 100.0%).

Extension personnel involved in Hurricane Irma reported that the most frequent message they were trying to convey to the general public was assistance with shelter (*n* = 48, 100%). Respondents involved in Panhandle wildfires reported the most frequent message they were trying to convey to the general public was providing information about disaster clean up (*n* = 6, 100%). Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

In Table 10, descriptive statistics (frequency and percentage) were reported to describe extension personnel's methods of communication used to contact extension clientele during Hurricane Irma (J003_15 through J003_24). The best method of communication was through phone calls (*n* = 108, 84.4%) and electronic mail (*n* = 105, 85.4%). Respondents indicated that the least favorable form of contacting extension clientele was through Twitter (*n* = 21, 17.5%). Descriptive results for all responses were presented in Table 10.

Table 10.
Methods of communication with extension clientele

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Social media	123	86	69.9	123	86	69.9	--	--	--	--	--	--
Facebook	126	90	71.4	126	90	71.4	--	--	--	--	--	--
Twitter	120	21	17.5	120	21	17.5	--	--	--	--	--	--
Instagram	119	17	14.3	119	17	14.3	--	--	--	--	--	--
Internet	120	95	77.9	120	95	77.9	--	--	--	--	--	--
Face to face	122	103	84.4	122	103	84.4	--	--	--	--	--	--
On-site visits	122	75	61.5	122	75	61.5	--	--	--	--	--	--
Phone	128	108	84.4	128	108	84.4	--	--	--	--	--	--
Text messaging	123	66	53.7	123	66	53.7	--	--	--	--	--	--
Electronic mail (e-mail)	123	105	85.4	123	105	85.4	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 11, descriptive statistics (frequency and percentage) were reported to describe the method of communication that extension offices in Florida used to communicate with clientele (J003_27 through J003_36). Extension personnel indicated that the top methods of communication used were electronic mail (n = 99, 86.1%) phone calls (n = 99, 85.3%), and Facebook (n = 99, 83.9%). Descriptive results for all responses were presented in Table 11.

Table 11.
Extension offices' method of communication with extension clientele

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Social media	116	97	83.6	116	97	83.6	--	--	--	--	--	--
Facebook	118	99	83.9	118	99	83.9	--	--	--	--	--	--
Twitter	111	26	23.4	111	26	23.4	--	--	--	--	--	--
Instagram	109	17	15.6	109	17	15.6	--	--	--	--	--	--
Internet	116	95	81.9	116	95	81.9	--	--	--	--	--	--
Face to face	115	98	85.2	115	98	85.2	--	--	--	--	--	--
On-site visits	117	88	75.2	117	88	75.2	--	--	--	--	--	--
Phone	116	99	85.3	116	99	85.3	--	--	--	--	--	--
Text messaging	116	67	57.8	116	67	57.8	--	--	--	--	--	--
Electronic mail (e-mail)	115	99	86.1	115	99	86.1	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 12, descriptive statistics (frequency and percentage) were reported to describe the key messages that were distributed to clientele during Hurricane Irma (J003_40RC1 through J003_42). Most notably, extension personnel conveyed access to resources as the main message to their clientele (n = 33, 24.1%). Additionally, extension personnel indicated their extension office had an internal plan to manage communication efforts amidst natural disasters (n = 107, 78.1%) in comparison to an external communication plan (n = 74, 54%). Descriptive results for all responses were presented in Table 12.

Table 12.
Communication messages and plans during natural disasters

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Message(s) you were trying to get across to your Extension clientele group during the recent hurricane												
access to resources	137	33	24.1	137	33	24.1	--	--	--	--	--	--
damage assessment	137	10	7.3	137	10	7.3	--	--	--	--	--	--
preparation	137	26	19.0	137	26	19.0	--	--	--	--	--	--
communication	137	9	6.6	137	9	6.6	--	--	--	--	--	--
Plan to manage communication efforts in a crisis like the hurricanes or other emergency situations												
internally	137	107	78.1	137	107	78.1	--	--	--	--	--	--
externally	137	74	54.0	137	74	54.0						

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 13, descriptive statistics (frequency and percentage) were reported to describe the methods of communication used when coordinating with elected officials during Hurricane Harvey and Texas Panhandle wildfires (J003_43RC1 thorough J003_49RC5). The persons involved in Hurricane Harvey indicated the best method of communicating with elected officials were through phone calls (n = 29, 100%). The persons involved in the wildfires indicated the best method of connected with elected officials were through phone calls (n = 34, 100%) and in-person visits (n = 34, 100%). Information regularly communicated from elected officials throughout Hurricane Harvey were progress updates (n = 12, 41.4%). Extension personnel in Texas Panhandle indicated information was not regularly communicated to them throughout the wildfire season (n = 7, 20.6%). Descriptive results for all responses were presented in Table 13.

Table 13.
Methods of communication with officials

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Email	63	55	87.0	--	--	--	29	28	96.5	34	27	79.4
Text messages	63	32	50.7	--	--	--	29	11	37.9	34	21	61.8
Phone calls	63	63	100.0	--	--	--	29	29	100.0	34	34	54.0
In-person visits	63	58	92.0	--	--	--	29	24	82.8	34	34	100.0
Information regularly communicated to you by elected officials												
current issues	63	10	15.9	--	--	--	29	5	17.2	34	5	14.7
infrastructure	63	7	11.1	--	--	--	29	5	17.2	34	2	5.8
progress updates	63	18	28.6	--	--	--	29	12	41.4	34	6	17.5
none	63	11	17.5	--	--	--	29	4	13.8	34	7	20.6

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix C and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 14, descriptive statistics (frequency and percentage) were reported to describe the methods of communication with extension leadership and community members during the 2017 hurricane and wildfire season in Texas (J003_50RC1 through J003_60RC2). Extension personnel involved in Hurricane Harvey indicated they received regular communication from extension leadership about their work (n = 26, 100%). The most effective form of communication with extension leadership was through e-mail for persons involved in Hurricane Harvey (n = 25, 100%) and Texas Panhandle (n = 15, 100%). There were 25 respondents from Hurricane Harvey and 15 respondents from the Texas Panhandle who indicated communication was effective from extension leadership. Extension personnel also reported that community members expressed their needs during Hurricane Harvey (n = 12, 100%) and Panhandle wildfires (n = 8, 100%). Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

RQ3. What forms of technology were being used by extension professionals after natural disasters?

In Table 15, descriptive statistics (frequency and percentage) were reported to describe methods of technology used after Hurricane Irma occurred (J004_01 through J004_09). Respondents indicated the most effective form of technology were smart phones (n = 121, 88.3%). A laptop computer was the second most effect for of technology after Hurricane Irma (n = 78, 56.9%). Respondents indicated the app most used during Hurricane Irma was Facebook (n = 26, 19%). Descriptive results for all respondents were presented in Table 15.

Table 15.
Technology used during natural disasters

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Smart phone	137	121	88.3	137	121	88.3	--	--	--	--	--	--
Cell phone	137	33	24.1	137	33	24.1	--	--	--	--	--	--
Tablet	137	38	27.7	137	38	27.7	--	--	--	--	--	--
Laptop computer	137	78	56.9	137	78	56.9	--	--	--	--	--	--
Wireless cellular hotspot	137	24	17.5	137	24	17.5	--	--	--	--	--	--
Desktop computer	137	35	25.5	137	35	25.5	--	--	--	--	--	--
Special software or applications (apps) that you used personally during the recent hurricane												
Facebook	137	26	19.0	137	26	19.0	--	--	--	--	--	--
GroupMe	137	23	16.8	137	26	16.8	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 16, descriptive statistics (frequency and percentage) were reported to describe the loss of electricity and cellular service extension personnel experienced after Hurricane Irma (J004_10RC1 through J004_13RC4). The majority of respondents indicated they did not experience loss of power at their office (n = 55, 44.1%). However, extension personnel indicated they were without power at their residence for three to six days following Hurricane Irma (n = 48, 37.2%). Respondents also indicated they did not have cellular service after Hurricane Irma for 1-2 days (n = 21, 16.3%). Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

In Table 17, descriptive statistics (frequency and percentage) were reported to describe the practicality of reporting using the *123 App* after Hurricane Harvey (J004_14RC1 through J004_18RC5). The *123 App* was originally called *Survey 123* and was created by the Texas Forest Service. However, for the purpose of this study *Survey 123* will be referred to as the *123 App* because that is the name used in the Hurricane Harvey Survey and can be referenced in Appendix C.

The plurality of extension personnel strongly agreed the *123 App* was easy to use (n = 13, 46.4%) and found reporting in general to be an easy process (n = 13, 46.4%). Extension personnel neither agreed nor disagreed the amount of time reporting was necessary (n = 8, 29.6%). Similarly, respondents agreed the amount of time reporting was necessary (n = 8, 29.6%). However, extension personnel somewhat disagreed daily reporting was not a big issue (n = 13, 48.1%). Extension personnel strongly agreed using an app similar to the *123 App* for other reporting requirements would be useful (n = 14,

50%). Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

RQ4. What forms of intra-organizational coordination were being used by extension professionals after natural disasters?

RO4.1. Describe educational programs currently utilized.

In Table 18, descriptive statistics (frequency and percentage) were calculated to observe usage of educational and response programs currently utilized in Florida (J005_01, J005_04 through J005_06, and J005_11). Extension personnel indicated there are coordinated organizational response at the state level (n = 117, 93.6%). Respondents also indicated extension serves as a member on community response action programs (n = 85, 62%). Descriptive results for all responses were presented in Table 18.

Table 18.
Usage of educational response programs

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Conduct any educational programs related to hurricanes or emergency situations in 2017	137	32	23.4	137	32	23.4	--	--	--	--	--	--
Coordinated organizational response												
county level	126	114	90.5	126	114	90.5	--	--	--	--	--	--
district level	125	110	88.0	125	110	88.0	--	--	--	--	--	--
state level	125	117	93.6	125	117	93.6	--	--	--	--	--	--
Extension is a member of community emergency response action programs	137	85	62.0	137	85	62.0	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

RO4.2. Describe extension's educational program effectiveness amidst natural disasters.

In Table 19, descriptive statistics (frequency and percentage) were reported to describe the educational program effectiveness at the county, district, and state level in Florida (J005_07 through J005_09). The highest level of program effectiveness was indicated at the county level (n = 125, 96.9%). Descriptive results for all responses were presented in Table 19.

Table 19.
Extension's educational program effectiveness

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Extension's response effectiveness												
county level	129	125	96.9	129	125	96.9	--	--	--	--	--	--
district level	126	123	97.6	126	123	97.6	--	--	--	--	--	--
state level	126	120	95.2	126	120	95.2	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

RO4.3. Describe suggestions for future programs.

In Table 20, descriptive statistics (frequency and percentage) were reported to describe suggestions for future programs extension personnel in Florida and Texas Panhandle may have (J005_02RC1 through J005_03RC4, and J005_10RC1 through J005_10RC5). Extension personnel indicated a need for disaster preparation programs prior to the emergency situation (n = 68, 49.6%). Respondents reported the program most needed after the emergency situation involves safety and clean up (n = 71, 51.8%). The persons in Florida (n = 25, 18.2%) and Texas Panhandle (n = 12, 35.2%) indicated a greater need for creating a plan of action for coordinating efforts during disasters and other emergency situations. Descriptive results for all responses were presented in Table 20.

Table 20.
Future program suggestions

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Suggestions prior to emergency situations												
government programs	137	2	1.5	137	2	1.5	--	--	--	--	--	--
disaster preparation programs	137	68	49.6	137	68	49.6	--	--	--	--	--	--
none	137	3	2.2	137	3	2.2	--	--	--	--	--	--
Suggestions immediately after the emergency situation												
government programs	137	3	2.2	137	3	2.2	--	--	--	--	--	--
safety and clean up	137	71	51.8	137	71	51.8	--	--	--	--	--	--
none	137	6	4.4	137	6	4.4	--	--	--	--	--	--
Recommendations for how extension can coordinate efforts during disasters and other emergency situations												
plan of action	171	37	21.6	137	25	18.2	--	--	--	34	12	35.2
partner with government programs	137	4	2.9	137	4	2.9	--	--	--	--	--	--
funding	171	4	2.3	137	1	.7	--	--	--	34	3	8.8
communication	137	15	10.9	137	15	10.0	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

RQ5. What agencies did extension professionals access or contact before during, and /or after a natural disaster?

In Table 21, descriptive statistics (frequency and percentage) were reported to describe the local agencies that extension utilized in Florida and Texas Panhandle (J006_01 through J006_09). Florida extension personnel reported using County Emergency Management as the agency they utilized during Hurricane Irma (n = 69, 56.6%). Extension personnel in the Texas Panhandle reported using County Road Department the most frequently throughout the 2017 wildfire season (n = 15, 78.9%). Descriptive results for all responses were presented in Table 21.

Table 21.
Local agencies utilized

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
County emergency management	141	81	57.4	122	69	56.6	--	--	--	19	12	63.2
County Fire/Rescue	139	43	30.9	120	31	25.8	--	--	--	19	12	63.2
Local Law Enforcement	141	50	35.5	122	39	32.0	--	--	--	19	11	57.9
County Road Department	138	45	32.6	119	30	25.2	--	--	--	18	15	78.9
County &/or City Public Works Department	139	46	33.1	120	41	34.2	--	--	--	19	5	26.3
County &/or City Solid Waste Department	139	34	24.5	120	30	25.0	--	--	--	19	4	21.1
County Health Department	139	33	23.7	120	29	24.2	--	--	--	19	4	21.1
Local/Regional Utilities (electric, gas)	139	47	33.8	120	40	33.3	--	--	--	19	7	36.8
Telephone company	139	25	18.0	120	20	16.7	--	--	--	19	5	26.3

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 22, descriptive statistics (frequency and percentage) were reported to describe the state agencies that were utilized in Florida after Hurricane Irma (J006_12 through J006_24). Respondents indicated University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS) was utilized the most during Hurricane Irma (n = 87, 70.7%). The agency extension personnel reported to use the least was University of Florida's Health Science Center (n = 9, 7.3%). Descriptive results for all responses were presented in Table 22.

Table 22.
State agencies utilized

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Florida Department of Health	124	24	19.4	124	24	19.4	--	--	--	--	--	--
Florida Department of Transportation	121	17	14.0	121	17	14.0	--	--	--	--	--	--
Division of Consumer Services	123	33	26.8	123	33	26.8	--	--	--	--	--	--
Division of Animal Industry	123	29	23.6	123	29	23.6	--	--	--	--	--	--
Division of Forestry	123	19	15.4	123	19	15.4	--	--	--	--	--	--
Division of Plant Industry	123	21	17.1	123	21	17.1	--	--	--	--	--	--
Office of Bio & Food Security Preparedness	123	11	8.9	123	11	8.9	--	--	--	--	--	--
Emergency management	122	37	30.3	122	37	30.3	--	--	--	--	--	--
Housing and community development	122	15	12.3	122	15	12.3	--	--	--	--	--	--
Water Management District	122	16	13.1	122	16	13.1	--	--	--	--	--	--
Housing and community development	122	9	7.4	122	9	7.4	--	--	--	--	--	--
UF/IFAS	123	87	70.7	123	87	70.7	--	--	--	--	--	--
Health Science Center	123	9	7.3	123	9	7.3	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 23, descriptive statistics (frequency and percent) were reported to describe federal agencies extension personnel utilized during Hurricane Irma (J006_25 through J006_34). Extension personnel reported utilizing the National Weather Service the most (n = 75, 62%). The federal agencies extension personnel reported as least used was the U.S. Occupational Safety & Health Administration (OSHA; n = 9, 7.5%) and the U.S. Army Corps of Engineers (n = 9, 7.5%). Descriptive results for all responses were presented in Table 23.

Table 23.
Federal agencies utilized

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
U.S. Environmental Protection Agency (EPA)	120	13	10.8	120	13	10.8	--	--	--	--	--	--
U.S. Occupational Safety & Health Administration (OSHA)	120	9	7.5	120	9	7.5	--	--	--	--	--	--
U.S. Amery Corps of Engineers	120	9	7.5	120	9	7.5	--	--	--	--	--	--
Farm Service Agency (FSA)	121	45	37.2	121	45	37.2	--	--	--	--	--	--
Natural Resources Conservation Service (NRCS)	121	39	32.2	121	39	32.2	--	--	--	--	--	--
Animal & Plant Inspection Services (APHIS)	119	13	10.9	119	13	10.9	--	--	--	--	--	--
Federal Emergency Management Agency (FEMA)	119	49	41.2	119	49	41.2	--	--	--	--	--	--
National Weather Service	121	75	62.0	121	75	62.0	--	--	--	--	--	--
National Hurricane Center	121	70	59.7	121	70	59.7	--	--	--	--	--	--

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix B. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 24, descriptive statistics (frequency and percentage) were reported to describe the amount of time extension personnel spent connecting with various stakeholders and reporting prior to Hurricane Harvey and the 2017 wildfires (J006_35 through J006_39). Extension personnel reported connecting with the Commissioners' court the most prior to Hurricane Harvey (n = 3, 75%). Respondents involved with the Panhandle wildfires reported connecting with school officials the most prior to the wildfires (n = 4, 66.7%). Descriptive results for all responses were presented in Table 24.

Table 24.
Time spent prior

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Connecting with Commisioners' court	17	11	64.7	--	--	--	4	3	75.0	13	8	61.5
Connecting with mayors	20	8	40.0	--	--	--	12	3	25.0	8	5	62.5
Connecting with school officials	10	6	60.0	--	--	--	4	2	50.0	6	4	66.7
Reporting data	7	4	57.1	--	--	--	--	--	--	7	4	57.1
Issues outside of normal content area(s)	3	1	33.3	--	--	--	--	--	--	3	1	33.3

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix C and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 25, descriptive statistics (frequency and percentage) were reported to describe the amount of time extension personnel spent connecting with various stakeholders and reporting after Hurricane Harvey and the 2017 wildfires (J006_40 through J006_44). One respondent involved in Hurricane Harvey indicated that they had connected with school officials (33.3%). Respondents involved in the Panhandle wildfires indicated that their time was most spent connecting with the Commissioners' court (n = 4, 80%) and connecting with school officials (n = 4, 80%). Descriptive results for all responses were provided in Table 25.

Table 25.
Time spent after

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Connecting with Commisioners' court	6	4	66.7		--	--	--	--	--	6	4	80.0
Connecting with mayors	9	4	44.4		--	--	--	--	--	9	4	44.4
Connecting with school officials	8	5	62.5		--	--	3	1	33.3	5	4	80.0
Reporting data	2	1	50.0	--	--	--	--	--	--	2	1	50.0
Issues outside of normal content area(s)	3	2	66.7	--	--	--	--	--	--	3	2	66.7

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix C and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

In Table 26, descriptive statistics (frequency and percentage) were reported to describe the methods of communication extension personnel used during Hurricane Irma and Panhandle wildfires to connect with others they have previously not connected with before (J006_45 through J006_52). Extension personnel involved in Hurricane Harvey indicated this was an opportunity for them to connect with other professionals after the natural disaster (n = 26, 89.7%). Similarly, respondents involved in Panhandle wildfires indicated they were able to connect with other professionals after the wildfires (n = 14, 41.1%). Extension personnel involved in Hurricane Harvey primarily indicated they did not connect with those individuals beforehand because they did not have applicable contacts (n = 10, 34.5%). Respondents in Texas Panhandle indicated they did not have applicable contacts as well (n = 7, 20.5%). Descriptive results for all responses were presented in Table 26.

Table 26.
Expansion of network

	Total			FL			TX-H			TX-F		
	n	*f*	%	*n*	*f*	%	*n*	*f*	%	*n*	*f*	%
Connect with others post natural disaster	63	40	63.4	--	--	--	29	26	89.7	34	14	41.1
Why or why not												
Did not have similar job descriptions	63	12	19.0	--	--	--	29	9	31.0	34	3	8.8
Did not have applicable contacts	63	17	27.0	--	--	--	29	10	34.5	34	7	20.5
Enacted legislation aimed to reduce wildfires	34	2	5.9	--	--	--	--	--	--	34	2	5.9

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix C and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

RQ6. What was the impact that extension professionals made in local communities after a natural disaster occurred?

In Table 27, descriptive statistics (frequency and percentage) were reported to describe the impact and challenges extension personnel experienced in their communities during Hurricane Harvey, Hurricane Irma, and the Panhandle wildfires (J007_01RC1 through J007_05RC5). The largest impact respondents' extension office experienced in Florida and both locations in Texas was dispersing information to community members and/or elected officials (n = 50, 100%). The largest way that extension personnel in Florida responded to hurricane relief in their county was through disaster clean up (*n* = 27, 100%). Respondents involved in Hurricane Harvey reported that the largest challenge they experienced in their new role with Rebuild Texas was having a clear understanding of their role (*n* = 11, 100%). Respondents involved in the Panhandle fires reported the largest challenge they experienced after the wildfires was the reporting process (*n* = 14, 100%). Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

RQ7. What was the damage assessed in local communities by extension professionals after a natural disaster occurred?

In Table 28, descriptive statistics (frequency and percentage) were reported to describe the assessment of damage after the hurricane and wildfires occurred Texas (J009_01RC1, J009_04RC1 through J009_05RC7). Respondents involved in Hurricane Harvey indicated the main source of damage in their county was attributed to flooding (*n*

= 26, 89.7%). Respondents in the Texas Panhandle reported the largest estimated economic impact was one to ten million dollars (n = 5, 38.5%). Respondents involved in Hurricane Harvey and in the 2017 wildfires were asked to provide a brief description of damage in their county. Extension personnel involved in Hurricane Harvey indicated flooding caused the most damage (n = 17, 58.6%), while respondents in Texas Panhandle primarily responded there was no damage in their county (n = 17, 50%). Descriptive results for all responses were presented in http://bit.ly/Myers_ThesisTables.

In Table 29, descriptive statistics (mean, standard deviation, minimum, and maximum) were reported to describe the amount of time spent each week only on Hurricane Harvey or the Panhandle wildfires (J009_06 through J009_09). Respondents involved in Hurricane Harvey indicated that the largest amount of time they spent only on Hurricane Harvey was within the first month of the event (M = 20.33, SD = 28.75, min = 0, and max = 80). Extension personnel involved in the 2017 Panhandle wildfires indicated that they largest amount of time they spent only on wildfire relief was during the first month the wildfires occurred (M = 37.17, SD = 24.46, min = 0, max = 80). Descriptive results for all responses were presented in Table 29.

Table 29.
Time spent only on natural disasters

	Total				TX-H				TX-F			
	M	*SD*	*min*	*max*	*M*	*SD*	*min*	*max*	*M*	*SD*	*min*	*max*
first month of the event	28.22	26.25	0	80	20.33	28.75	0	80	37.17	24.46	0	80
October ’17 and December ‘17	--	--	--	--	--	--	--	--	--	--	--	--
first of the year	13.22	12.85	0	53	11.60	12.12	0	44	14.03	13.33	1	53
present day forward	10.90	11.72	0	45	10.90	10.21	0	25	10.90	12.32	1	45

Note. Items in this table were abbreviated to preserve space. The full questions included in the questionnaire are included in Appendix C and Appendix D. There could have been a maximum of 137 responses for FL, 29 responses for TX-H, 34 responses for TX-F, and a total of 200.

CHAPTER V

CONCLUSIONS

Summary

The purpose of this study was to describe the roles of extension personnel through their experience from trainings, communication with elected officials, and communication with other agencies and members within the community during and after natural disasters. In addition, the purpose of this study was to address the personal and professional needs of extension personnel to best assist them in their role. Understanding the changing role extension personnel face and analyzing potential policies that affect the agency will assist agents in preparation and mitigation to future disasters.

In the case of Hurricane Irma, extension personnel were surveyed about professional needs, personal needs, communication, technology, organizational coordination, training, and resources. In the case of Hurricane Harvey, extension personnel were surveyed about damage in their county, the time it took to connect with local officials, reporting, communication amongst different levels of extension, and training. In the case of the Texas Panhandle fires, extension personnel were surveyed about professional needs, damage in their county, the time it took to connect with local officials, communication, and training.

From analyzing data collected in this study, it was determined the role of extension personnel amidst disasters is to respond to the needs of the community by utilizing technology, leading trainings, and identifying unmet needs and allocating resources in those areas. Extension personnel are also responsible for utilizing

volunteers, building relationships within the community, and communicating with extension leadership. However, the changing role of extension personnel as a result of natural disasters has not been clearly defined. Extension personnel in Florida and Texas have expressed a need for a clear definition of their role and reduced job expectations.

Results

RQ1. What were the personal and occupational needs of extension personnel after natural disasters?

RO1.1. Describe extension professionals' personal needs.

In all three cases, extension personnel experienced damage to their home or other personal hardships. This question was only directed towards extension personnel in Florida. Respondents in Florida indicated they experienced personal stress or emotional symptoms after Hurricane Irma occurred. However, on a positive note, extension personnel indicated they had family as their primary support network for their emotional and physical needs. Extension personnel indicated they relied on friends, church, local government, and peers for physical and emotional needs in the aftermath of Hurricane Irma.

Florida respondents also noted they had personal needs involving a lack of resources, stress from Hurricane Irma, and power outages. This could indicate extension personnel have a range of needs depending on where the disaster hits regionally. It should not be assumed that each member of extension has a strong familial or community support system, therefore, extension should have a baseline level of resources for all staff involved.

RO1.2. Describe extension professionals' occupational needs.

The greatest professional challenges indicated by Florida extension personnel were work life balance and experiencing a lack of communication. Professional challenges were indicated as least pressing were not having internet and power outages. These responses illustrate a need for clear expectations of what was expected from extension personnel was more pressing than electricity from an occupational perspective. Extension leadership needs to construct a disaster relief plan that will alleviate stress and enhance communication as the top priorities. Creating clear expectations for extension personnel and having emergency supplies such as generators in extension offices are all factors to consider in preparation for the next natural disaster.

When asked the greatest difficulty extension personnel experienced in terms of balancing personal and professional needs, taking care of family and long shifts were the most pressing. From an occupational standpoint, the least concerning challenge was getting to the extension office after Hurricane Irma. These responses indicate there was a need for outlining clear objectives and expectations in order for extension personnel to meet the needs of their family and prepare for the hours they will be working.

When asked about areas regarding professional development, extension personnel in Florida indicated the areas they needed strengthened the most are helping clientele cope with stress and hurricane disaster recovery. The least indicated area was professional development in personal needs (emotional and physical needs). Extension personnel would rather receive training in areas that will assist others rather than coping with their personal needs emotionally and physically. This indicates that extension

personnel are adhering to the original mission of being a service-based organization. The priorities of extension personnel are to serve their clients first before they help themselves.

Extension personnel were also asked about professional development in areas that did not pertain to hurricanes. Respondents involved in Hurricane Irma indicated they would like to receive training in helping clientele cope with stress the most. They also indicated they are least interested in receiving training that helps them cope with personal stress. Extension personnel from Texas Panhandles indicated they would like to receive training in wildfire disaster preparedness and wildfire disaster recovery the most. Respondents reporting on Panhandle wildfires indicated they would like to receive training on how to work with the media the least. Perhaps there are different priorities of extension personnel based on the incident and needs of the community. The variation in responses from personnel in Florida and Texas Panhandle indicate that future trainings should be tailored to the needs of that specific state or the primary disaster extension personnel from that region experience.

Extension personnel in Florida and Texas Panhandle were asked their preference on conference attendance in relation to disaster preparation. Extension personnel in Florida had a preference to attend district meetings the most and telephone conferences the least. Respondents in Texas Panhandle had a preference to attend district meetings the most and statewide conferences the least. Results from this section indicate extension personnel would prefer to meet at a smaller, local level in person rather than at a distance

or at a statewide conference. This is an indication that extension leadership should evaluate their programs for distance learners to meet the changing preferences.

Similarly, Extension personnel in Florida indicated the likelihood they would attend conferences for other emergency situations is greater at a district meeting and least likely at a telephone conference. Respondents also indicated they would prefer to receive print materials incorporated into the conference rather than participation through Facebook live.

Extension personnel in Florida and Texas were asked about their level of readiness for the upcoming hurricane and wildfire season. Florida extension personnel indicated the greatest professional need they had was knowing where to access information for community members. However, the plurality of extension personnel in Florida indicated they did not have a professional need during the 2017 hurricanes. Extension personnel involved in Hurricane Harvey indicated that hurricane preparation training did take place prior to Hurricane Harvey, but more training is needed. Extension personnel reported being overwhelmed, struggling to find a work-life balance, and having a lack of communication amongst other disaster relief agencies who were also working in the community. In order to better understand their role, training such as conflict management and stress test simulations may be viable options in preparation for future disasters.

Respondents involved in Hurricane Harvey somewhat agreed their new role in Rebuild Texas can be applicable to other counties. There was not strong opposition or approval on either end of this question. Respondents involved in Hurricane Harvey and

Texas Panhandle indicated they somewhat agreed that extension's structure is transferrable to other disaster emergencies or other responding agencies. When asked if extension personnel thought the protocol used during Hurricane Harvey and Panhandle fires should be used in other disasters the plurality of responses strongly agreed or somewhat agreed.

Extension personnel involved in Texas disasters were not certain whether their new role can be incorporated into the daily role of a county agent. The lack of responding toward agree or disagree is an indication that more assessments need to be performed as this role was created in 2017.

Texas Panhandle respondents neither agreed nor disagreed they felt prepared to take on their new role from the 2017 wildfire season. While the respondents involved in Hurricane Harvey primarily responded they were not prepared to fill their new role with Rebuild Texas. There is a need for extension personnel to receive clear expectations as to what their new role is amidst natural disasters.

When asked about trainings received prior to the disaster in their region, respondents involved in Hurricane Harvey primarily indicated they received training when needed. However, there was only one respondent involved in Texas Panhandle who indicated they had received wildfire training. There were two other people who responded to this question who indicated they did not receive any training at all.

RQ2. What communication channels were being used by extension personnel after natural disasters?

Extension personnel in Florida indicated their local extension office made greater use of the mass media channels during Hurricane Irma rather than the responder themselves. Respondents also indicated their clientele group had a greater understanding of extension's efforts rather than the general public. Many respondents indicated they had a greater line of communication with their clientele rather than the general public, perhaps due to previously established relationships. In order to connect with community members, some extension personnel reported working in the community by being assigned to work in shelters, coordinating volunteers, and using various forms of social media.

The primary media platforms used during Hurricane Irma was the internet/web followed by flyers and print materials. The platforms used the least were TV public service announcements and live TV interviews. Florida respondents indicated the most effective way to convey information to the public was through the internet/web. The least effective way to reach the public was conducting live radio interviews. However, radio is an alternative form of communication during power outages; therefore, it may serve as a valuable tool of connecting with extension personnel and community members during lengthy power outages. For example, after hurricanes occur in the Caribbean it was found that farmers rely on radio public service announcements as the greatest form of communication (Ganpat, Harry, & Harder, 2018). Radio training may be another avenue of exploration in preparation for future disasters.

The primary message extension personnel in Florida were conveying to the public was assistance with shelter. The message they were trying to convey the least was

urban forest management. The primary message extension personnel in Texas Panhandle was trying to convey to the public was assistance with cleaning up from the wildfires. However, the plurality of respondents indicated they did not connect with the public.

Extension personnel in Florida reported they communicated with extension clientele after Hurricane Irma primarily through electronic mail (e-mail) and face to face visits. Both methods are a viable option, however using alternative methods such as radio and social media should be considered in order to attempt all methods of communication in an emergency situation.

Respondents used Twitter and Instagram the least to communicate with their clientele. The primary method extension offices used to communicate with extension clientele were through electronic mail (e-mail), phone calls, and Facebook. The method extension offices used the least to contact extension clientele is through Twitter and Instagram.

The primary message extension personnel in Florida were attempting to convey to the public was where to access resources. Additionally, Florida extension personnel reported a higher frequency of having an internal plan to manage communication efforts in a crisis such as hurricanes or other natural disasters rather than an external plan.

Extension personnel involved in Hurricane Harvey and Panhandle wildfires were asked the method of communication they use to contact elected officials and the information most frequently discussed. Hurricane Harvey respondents indicated they communicated with elected officials the most by phone calls and the least by sending text messages. Panhandle wildfire respondents indicated they communicated with

elected officials the most by phone calls and in-person visits and the least by text messages. Hurricane Harvey respondents indicated the primary message they received from elected officials were progress updates after the hurricane took place. It is interesting to note the primary response from Texas Panhandle indicated extension personnel did not communicate with elected officials.

Respondents involved in Hurricane Harvey and Texas Panhandle were also asked about their communication with extension leadership and colleagues they had previously not worked with before. The primary response from Hurricane Harvey personnel indicated they did receive regular communication from extension leadership regarding their work. Hurricane Harvey personnel indicated the primary method they received communication from extension leadership were through phone calls. The least common method was conducted by in-person visits.

Interestingly, there were confounding responses from Texas Panhandle personnel responding to the yes or no the question asking if they received regular communication from extension leadership. Perhaps future questions should be clearer by defining extension leadership or making the question mandatory to respond. However, respondents indicated the primary method they received communication from extension leadership were through e-mail. The least common form of receiving feedback occurred through text messages and in-person visits. There were little responses indicating why communication from extension personnel was beneficial or needed more detail.

Respondents involved in Hurricane Harvey and Texas Panhandle indicated they had effective communication from community members regarding recovery work in the

community. Extension personnel from both cases indicated the primary information reported to them was concerning needs of people. Whereas, there were no responses regarding needs of animals.

RQ3. What forms of technology were being used by extension personnel after natural disasters?

Respondents in Florida indicated the form of technology they used the most after Hurricane Irma were smartphones. The technology they used the least was a wireless cellular hotspot. Facebook was used slightly more than GroupMe when asked about the special software or applications (apps) extension personnel used during the hurricane.

Extension personnel in Florida primarily indicated they did not lose power at their office following Hurricane Irma's landfall. However, there were some respondents who reported their office was without power for more than a week. When asked if they were without power at their residence, the response most frequently selected was three to six days. There were some extension personnel who, however, who reported they were without power at their residence for more than two weeks. The plurality of respondents also indicated they personally lost cellular service. The primary response selected was that cellular service was lost for 1-2 days.

Extension personnel involved in Hurricane Harvey were asked about the level of difficulty, amount of time reporting, and other reporting requirements regarding the *123 App* they were required to use after Hurricane Harvey. Respondents primarily indicated they strongly agree using the *123 App* was easy to use. There were no respondents who selected strongly disagree on this particular question, which indicates apps are a viable

resource in the reporting and communication process. Extension personnel primarily strongly agreed that reporting in general was easy on the *123 App*. Respondents mainly agreed or neither agreed nor disagreed that the amount of time reporting was necessary. However, the plurality of respondents indicated they strongly disagreed with the statement that daily reporting was not a big issue. Extension personnel strongly agreed they would like to use a similar app-based approach for their other reporting requirements. There were no respondents who strongly disagreed with using a similar approach as the *123 App* for other reporting requirements. It was not reported if the responses varied by age.

RQ4. What forms of intra-organizational coordination were being used by extension personnel after natural disasters?

RO4.1. Describe educational programs currently utilized.

Florida respondents indicated the primary coordinated organizational programs for education and response efforts are conducted at the state level rather than the county or district level. Respondents also indicated extension is a member of emergency response action programs within their community. This implies extension has some local involvement in relation to emergency planning, which strengthens ties with community members and provides a clearer understanding of their role amidst disasters.

RO4.2. Describe extension's educational program effectiveness amidst natural disasters.

Extension personnel in Florida were asked at what level from the county, district, or state extension's educational programs were most effective. There was a slight

difference in responses with county level selected as the most effective level for educational programs amidst natural disasters. This implies extension personnel have a slight preference towards conducting educational programs at the local level. Perhaps they have a greater sense of involvement and jurisdiction over the programs on a local level. Another advantage is that programs can be specifically tailored to the needs within their community.

RO4.3. Describe suggestions for future programs.

Florida extension personnel strongly indicated a preference for disaster preparation programs prior to emergencies over conducting programs provided by the government. Similarly, there was a strong preference to conduct programs on safety and clean up in their community directly after the emergency rather than conducting government programs. Extension personnel most frequently reported the need for extension to create a cohesive plan of action during disasters and other emergencies. There was not a strong indication for the need to develop coordinating efforts concerning collaborating with government programs or accessing funding during disasters and other emergencies.

RQ5. What agencies did extension personnel access or contact before during, and /or after a natural disaster?

Florida extension personnel indicated they utilized County Emergency Management the most after Hurricane Irma. Respondents reported using their local telephone company the least. Panhandle extension personnel reported using County Emergency Management and County Fire/Rescue the most. Extension personnel

indicated they used County and/or City Public Works Department and County and/or City Solid Waste Department the least after the 2017 wildfires.

The state agencies Florida extension personnel used the most after Hurricane Irma was University of Florida's Institute of Food and Agricultural Sciences (UF/IFAS). The state agencies extension personnel reported using the least were Housing and Community Development and the Health Science Center. This question was only asked in the Florida survey, therefore there may be further implications to ask similar questions to extension personnel in Texas for a comparative study.

In addition, Florida extension personnel were asked to report the federal agencies they worked with after Hurricane Irma's landfall. The agencies with the most credibility were the National Weather Service followed by the National Hurricane Center. The agencies reported as used the least were the U.S. Occupational Safety & Health Administration (OSHA) and U.S. Army Corps of Engineers. This implies OSHA and U.S. Army Corps of Engineers were not needed by extension for this particular event, but extension personnel should still understand these organizations and how they can be utilized before and after disasters.

Extension personnel involved in Hurricane Harvey and Panhandle wildfires were asked to report the amount of time spent working with various stakeholders before and after the disaster occurred. Hurricane Harvey respondents indicated the stakeholders they connected with the most prior to the disaster were the Commissioners' court. There were no responses indicating how much time was spent reporting data or dealing with issues outside normal content area(s). Texas Panhandle respondents indicated the stakeholders

they connected with the most prior to the wildfire were the Commissioners' court. There was only one respondent indicating the amount of time they spent reporting outside normal content area(s) prior to the 2017 wildfires.

When extension personnel involved in Hurricane Harvey were asked how much time they spent working with various stakeholders after the Hurricane there was only one response for the five questions asked in this section. Respondents involved in Texas Panhandle indicated they primarily spent time connecting with Commissioners' court, mayors, and school officials.

Extension personnel involved in Hurricane Harvey and Panhandle wildfires were also asked if their role in preparing and mitigating from the disaster allowed them to connect with others they had previously not worked with prior to the disaster. The plurality of respondents in both Hurricane Harvey and Panhandle wildfires indicated they had not worked with these individuals prior to the disaster because they did not have applicable contacts beforehand. Additionally, two respondents from Panhandle wildfires indicated they were aware of legislation that has been enacted in an effort to reduce wildfires in Texas.

RQ6. What was the impact that extension personnel made in local communities after a natural disaster occurred?

Extension personnel in all three cases were asked about the impact and challenges they faced within the community they served after the natural disaster. Respondents involved in all three cases reported the greatest success story was dispersing information to community members and elected officials. The least successful

impact in Florida was utilizing volunteers. There were no responses for delivering/volunteering in shelters and utilizing volunteers in Hurricane Harvey or Panhandle wildfires.

Florida extension personnel were asked to report how they responded regarding the hurricane relief efforts within the community they served. The response most frequently selected was assisting with disaster clean up. The response selected the least was utilizing volunteers.

Extension personnel involved in Hurricane Harvey and Texas Panhandle were asked to report challenges they faced within their new role after the disaster. The greatest challenge Hurricane Harvey personnel indicated was understanding their new role within Rebuild Texas. No respondents selected the reporting process as their greatest challenge. However, Texas Panhandle personnel indicated the reporting process as the greatest challenge after the wildfires. The response least indicated was getting connected to the right person.

Extension personnel involved in Hurricane Harvey and Texas Panhandle were asked about ways to improve the process for to prepare for future disasters. Extension personnel involved in Hurricane Harvey suggested the greatest way to improve the process for future disasters is to conduct more trainings. Respondents from Texas Panhandle indicated conducting more training and reducing job expectations as the greatest way to improve the process after wildfires occur.

RQ7. What was the damage assessed in local communities by extension personnel after a natural disaster occurred?

Extension personnel involved in Hurricane Harvey and Texas Panhandle were asked a series of questions surrounding damage in the communities they served after the disaster. The greatest damage Hurricane Harvey personnel indicated was flooding. The least damage in the areas they served were due to storm surge. The greatest amount of damage reported from extension personnel in Texas Panhandle was loss of pasture/grazing land and loss of livestock. No respondents selected wind and flooding and wind for this series of questions.

Respondents involved in the Panhandle wildfires selected economic damage ranging from 1-10 million dollars as the most frequent response. One respondent reported an economic impact in their area greater than 10 million dollars.

Recommendations

Recommendations, based on the findings and results of this study, were presented in eight sections. The eight sections include personal needs, professional needs, communication, technology, organizational coordination, agencies, impact, and damage.

However, it is important to note the limitations of the study. Limitations include the participants of the survey who were targeted populations in three different states. Data collected from the surveys were self-reported with limited questions and focus of data. Additionally, every county varied based on population and funding; therefore, resource allocation and extension professionals vary on a situational basis. Extensive recoding was performed to find common themes amongst the responses in all three

cases. Responses may be limited because participants were not forced to respond before moving to the next question.

Personal needs

It is vital that extension personnel are able to meet their personal needs such as damage to their home or other personal hardships in addition to meeting the expectations of their role within extension. Perry (2007) stated disasters not only cause disruption, but also cause a rift between the social structure norms and values. Although extension personnel have resources to meet their needs through support systems such as family it is evident that there are areas that can be targeted in preparation for the next hurricane or wildfire season.

One respondent from Hurricane Harvey stated the following,

> "I've had difficulty planning and conducting my planned educational programs. Since August I've been late on almost every deadline. I've had to plan program agendas at the last minute. I just can't seem to get caught up. I haven't dropped a single program or rescheduled a previously planned event due to the extra work load, but it's been exhausting. I've lost a lot of evenings and weekends spent with my family due to my duties with Rebuild Texas. I've had to work late many evenings just to get caught up on my normal work duties while during the day I had to complete tasks with Rebuild Texas. From September 5 through December 12 our Extension Office was dedicated 8 hours a day to handling inquiries on well water safety and conducting well water tests. We had 606 county residents pass through our office doors seeking information on well water quality and

testing, and in all cases, we interacted with each of these individuals on 3 occasions. That's 1,818 individual contacts, or 29 office contacts each work day from September to early December, all dealing with well water quality and testing. We tended to our normal job responsibilities, but these added tasks came first, and our normal jobs came second."

Disaster plans must be practiced and known by all extension personnel in the event of the next hurricane and wildfire season. Extension personnel need to be clear on their role and the number of hours they are expected to work while balancing their personal needs.

Professional needs

Extension personnel indicated their top personal needs were creating a work life balance and enhancing communication during the disaster. Professional development sessions need to begin as quickly as possible in the areas outlined below before the next series of natural disasters occur. Perry (2007) noted disasters directly impact the social order with interrupted stability, followed by adaptation, then a resumption of life occurs. Extension personnel experience the same cycle of interrupted stability, adaptation, and resumption through their changing roles following a disaster.

The most pressing issues in another set of questions were taking care of family and experiencing longer hours over a long period of time. Extension personnel also indicated they would like to receive training in procedures that best assist extension clients with helping clientele cope with stress after a disaster occurs. In the series of questions that addressed professional needs, extension personnel indicated they would

rather spend their professional development resources on helping clientele rather than resources that help them cope with personal needs.

Extension personnel indicated the best structure for participating in a conference is at the district level. In addition, providing print materials at the conferences were indicated by extension personnel to create an increased level in participations. Extension personnel indicated they were not prepared to take on their new role after the disaster occurred, trainings must take place before the next disaster season to equip extension personnel with resources that will help them personally and professionally.

Communication

Extension personnel should use the methods of communication and strategies they used to build relationships with their extension leadership and apply those same methods when attempting to build relationships with elected officials. In preparation for future disasters there needs to be a detailed crisis communication plan including internal and external methods of communication. Disasters directly impact the social order with interrupted stability, followed by adaptation, and then a resumption of life in a stable period (Perry, 2007). Furthermore, disasters are characterized as a social disruption that is initiated in the social structure and remediated through social structural manipulation (Perry, 2007). Disasters stem not only from the factor that causes the disruption, but also from the rift between social structure norms and values. Extension personnel assist with the adaptation stage.

The main message they were trying to get across to the public was assistance with shelter and cleaning up from wildfires. In terms of communication with elected

officials, it was done best by phone calls. Results from this portion of the study reflect that extension personnel were assisting to repair the rift between social structure norms and values. In addition, extension personnel in Florida indicated they served as a member of emergency response action programs at the local level.

The most strategic avenue to reach extension clientele and the public after the disaster is through the local extension office. The primary way to continue reaching the public is to continue using the internet, flyers, and print materials. In Florida and Texas, the least used method to reach the public was through TV interviews and radio announcements. However, those should still be considered options in the future. Respondents indicated the least with extension clientele through social media platforms such as Twitter and Instagram. Using these social media platforms may be an area to expand communication during future disasters.

Communication with elected officials was most frequently done through phone calls and in-person visits. Respondents in Florida indicated they received adequate information from elected officials regarding progress updates from Hurricane Irma. However, extension personnel involved in the Panhandle fires primarily indicated they did not communicate with elected officials. Respondents in Texas and Florida both indicated they received communication from extension leadership regarding progress updates with the disaster. Communication with elected officials is vital, extension personnel and elected officials need to strengthen their relationships to have a direct line of communication before the next disaster occurs in Texas.

Technology

Having a common method of reported amongst various regions would set a precedent for reporting expectations and increase the feasibility for a cohesive database. Respondents primarily indicated they used smart phones amidst the disaster they were involved in. Facebook and GroupMe were also used to as alternative methods of communication. A further area of exploration should be if extension personnel have an alternative plan if electricity is down for extended periods of time. Having an alternative meeting spot or knowing their role if communication ceases for an extended period of time is critical when preparing for the next disaster.

When asked about using technology for reporting purposes, extension personnel involved in Hurricane Harvey indicated the *123 App* was easy to use. Respondents also strongly agreed this method of reporting can be useful for other reporting requirements. Perhaps the *123 App* can be distributed to other regions such as Texas Panhandle and Florida to create a streamlined method of reporting.

Organizational coordination

As the role of extension personnel continues to expand in their community, they need adequate training to be prepared for disaster situations. Florida respondents primarily reported their coordinated organizational programs for education and response are done at the state level. However, as noted in the professional development section respondents showed a stronger preference to conduct educational programs at the local level. Current educational programs should be kept at the local level. Extension personnel indicated having educational programs at the local level has been the most

effective in comparison to a larger scale. Extension leadership should consider having a broad set of trainings at the state level and conducting tailored trainings at the regional or district level.

For future programs, extension personnel indicated a strong preference for creating safety and clean-up programs. Extension personnel also indicated a strong need for creating a cohesive plan of action during disasters and other emergency situations.

A respondent from Florida had the following suggestion,

> "I think it would be beneficial if there was a class held, or several classes to include each department. 4-H could do programs for the children about how hurricanes occur, FNP can do food safety and prep, Hort can discuss how to prep plants and trees and what to do after a storm. It can be done as individual classes or as a 'fair' type event."

From these responses it is evident there is room for improvement and expansion of trainings. McEntire (2007) described emergency managers as public servants tasked with employing knowledge, techniques, strategies, tools, organizational networks, and community resources with an objective to protect people, property, and the environment from disasters.

Another common theme noted when analyzing responses is the need for a cohesive plan of action. Having a clear plan that everyone is aware of will create clear job expectations and hopefully lead to creating a better balance between work and home. One option for creating a cohesive plan of action is to have an extension liaison at the

state, local, and regional level in constant communication with other disaster relief agencies to discuss preparation and implementation strategies.

Agencies

Extension personnel need clear direction from extension leadership and local officials on how to proceed without overstepping or not fulfilling the expectations in their new role. Florida and Texas utilized different agencies depending on the needs of their communities from the disasters they experienced. If a particular agency was utilized over another it is recommended that same agency be used in the future. Particular agencies may be used on a situational basis.

Another common theme after analyzing all responses from the three cases is that extension personnel are unclear on their role after the disaster. There are many disaster organizations that become involved to help assist the communities affected by the disaster.

A respondent from Florida stated,

> "Extension really just needs to fit in with other Emergency Services authorities (letting them take the lead)- some activities are just above our business model - we should be educational merchants - we must be careful not to duplicate services or get in the way - we still need to find our niche - Extension within agricultural emergencies is fully involved and is perhaps the best model."

Impact

Extension personnel indicated the greatest way to reduce challenges they faced in upcoming disasters is to conduct more training and reduce job expectations. A common

theme throughout the respondents is to have a cohesive plan of action and for extension to clearly outline their new roles within disasters.

Extension personnel were asked about the impact and challenges they faced within the community they served throughout the disaster. The area of success respondents reported in most frequently was dispersing information to community members and elected officials. However, the least successful impact in Florida was utilizing volunteers. Respondents in Hurricane Harvey and Texas Panhandle did not indicate utilizing volunteers after the disaster occurred. In all three cases, extension needs to explore avenues to recruit volunteers after disasters. A clear plan of action for recruiting and utilizing volunteers needs to be created in order to best serve the affected communities.

Damage

Damage reports serve as a tool to predict areas of the community that may be impacted the most or clientele that may need the most financial assistance. Respondents in this portion of the survey determined the physical and economic damage in the county they worked in. Damage reports conducted by extension personnel should be compiled into a streamlined database for future reference. When the next damage occurs extension personnel will be able to access this data to determine areas that are most likely to become flooded or areas that may have an excess of vegetation from not being burned by the first wildfire.

Implications for future research

According to OMB (2006), standards are implemented to verify that survey results are representative of the target population to be used with confidence and make informative, data-based decisions. Agencies must ensure the sample population are appropriate for the study and are evaluated against the target population for quality analysis and recommendations (OMB, 2006). Conducting a study that is multi-regional should have a single cohesive method of instrumentation to streamline the data collection process. Having a cohesive data collection process will shorten the recode and data calculation process.

Practitioners and policymakers need to know that open-ended responses will lead to more candid responses when people can freely answer without having a list to select from. However, it is also extremely time consuming on the researcher's end to read each response and assign it to a set of common themes. Reporting requirements need to be clarified from administrators and policymakers in order to collect the data they are looking for.

An agency at the federal level may be better equipped to conduct a multi-regional analysis. In particular, FEMA's Mitigation Assessment Team (MAT) studies disasters of national significance on how hazards affect the built environment (FEMA, 2009). MAT's studies are driven by FEMA's Mitigation Directorate, to reduce damages from future disasters (FEMA, 2009). Data are collected by deploying teams directly to the impacted area to investigate infrastructure and assess damage.

I recommend using data systems used projects surrounding natural disasters include the following characteristics to promote project success and complete, accurate data analysis:

1. A core set of variables with universal definitions consistent across all regions, data systems, and projects;
2. Drop down menus based off of previous common responses;
3. Fully documented and updated data dictionary; and
4. Export option to convert categorical data from string to numeric codes to expedite data analysis.

Future disaster recovery projects may avoid many of the challenges faced during the recoding process by including an evaluation team in the beginning stages of project development. For a cohesive data set, this would allow the evaluation team to proactively identify and resolve potential issues with data processing, analysis, and reporting from the beginning rather than addressing them afterwards. To prevent further issues, evaluation teams need access to tracking systems, data dictionaries, and samples of data and reports to identify issues throughout the collection process. Conducting a Q sort study, one on one interviews, and focus groups are other areas of consideration during the data collection process.

In addition, paradata should be collected to identify how long the surveys took to fully complete and the extension personnel who are completing the surveys. Paradata is the concept of data collected throughout the survey process and is utilized to improve the data collection process (Kreuter & Casas-Cordero, 2010). Paradata can be used to

identify holes within the survey and identify populations of extension personnel that have been overlooked.

To strengthen future response programs, the following steps are recommended from the United States Government Accountability Office (GAO, 2009), *Disaster assistance: Greater coordination and an evaluation of programs' outcomes could improve disaster case management*:

1. Establish a realistic and achievable time line for designing and implementing a case management program for federal disasters.
2. Ensure the federal disaster case management program FEMA develops includes practices to outline clear expectations amongst federal and nonfederal stakeholders.
3. Conduct an outcome evaluation to determine the results of disaster case management pilot programs from previous victims of natural disasters.

Implications for practice

The surveys in Florida and Texas asked extension personnel about personal needs, professional needs, communication, technology, educational programs, agencies, impact, and damage assessed. Future questions to ask include suggestions for improving training on the state, regional, and district level. Extension personnel should also be asked how they would define their role now that disasters have happened.

There is also a need for extension leadership to look into reporting requirements. Personnel from Hurricane Harvey were mandated to report on a daily basis; however, this was problematic because certain counties were more impacted than others. Counties

that were barely impacted were still expected to report daily and counties that were impacted the most were expected to report daily when their time could have been allotted elsewhere. There needs to be a set timeline for reporting requirements and a damage threshold to determine if extension personnel in a set county need to frequently report. There also needs to be a streamlined database that collects reports such as the *123 App*.

After analyzing all three data sets, there were a series of common themes that occurred across states or incidents. The common themes were personal needs, clearer work expectations, and a cohesive plan of action. Personal needs must be met in addition to meeting work requirements. Extension personnel in all three states reported their home and property were also damaged from these disasters. Not only are extension personnel trying to help the community through these disasters, but their homes and families are also impacted by these disasters. There was a need for clearer work expectations such as shift duration and where they are assigned to help after the disaster.

Respondents also reported a need for a cohesive plan of action amongst extension personnel and a clarity of their role amidst other disaster organizations before the next disaster occurs. It is vital to enhance extension's crisis networks. Prioritizing communication by sharing ideas, reports, and resources amongst all stages of recovery internal and external to extension may be an avenue to reduce stress and increase communication.

There were also themes that were unique to each state or incident. In Florida, extension personnel expressed a greater desire to have learning sessions that will benefit

their clientele rather than targeted to their own personal needs. Recommendations for professional development are not solely restricted to agents. There is always room for improvement amongst all levels, and professional development should be encouraged amongst all ranks.

Florida extension personnel also indicated they would rather attend a conference at a district level rather than the state. During Hurricane Irma the extension office was able to communicate messages to a broader scope of community members through the internet, flyers, and print material. Respondents indicated a preference to transition education programs to the district level. There was also a need to develop safety and clean-up programs.

During Hurricane Harvey, extension personnel were required to provide progress updates daily through the *123 App*. Respondents indicated the *123 App* was generally easy to use and they recommend using it in other areas of their job where they have to report. The greatest impact extension personnel reported having in their community was dispersing information to community members and elected officials.

Participants in Florida and Texas Panhandle were asked about the national, state, and local agencies they utilized amidst their respective natural disaster. Different agencies were used as resources depending on the specific needs of the impacted region. Extension personnel should continue relationships with these agencies while simultaneously developing new relationships with other disaster relief organizations and members of the community in preparation for the next disaster.

Future research from this study

It is strongly recommended when future research is conducted in on a multi-regional level there is a cohesive set of evaluations sent to all areas. Common themes and variables should be applicable across states with a section on organizational policies with guidance from extension leadership. Clear communication must be performed amongst evaluation teams with a transparent set of measures before the stage of survey distribution. One master codebook amongst all evaluations would lessen the likelihood of human error when calculating results.

Future research should be done on training program implementation at the local and state level. Extension personnel had a clear indication of the programs they would like to attend to prepare for upcoming disasters. A pre-test and post-test study, with clear measures, of programs conducted before the disaster and assessing program effectiveness after the disaster should be further pursued for professional development of extension personnel. Extension personnel should be surveyed about the program effectiveness of internal programs within extension and programs conducted in their communities by other organizations in relation to disaster planning and relief. Having a deeper understanding of the internal relations and results of these programs will provide clarity towards extension personnel's changing roles and their impact on the community.

Research should be conducted to determine the best method to clarify the changing role of extension personnel both regionally and by incident. Disaster situations will continue to occur, it is vital that extension personnel understand their role when interacting with members of the community and other disaster relief agencies.

It is evident that extension is a service-based organization as employees tend to help others before they help themselves but helping employees must also become a priority. Stress was also a common theme reported amongst extension personnel in all three incidents. Future research should explore avenues to alleviate stress during amidst natural disasters for extension personnel and managers. Balancing personal and professional needs should also be included in this assessment.

Conclusions

The role of extension personnel continues to expand on a national level as natural disasters continue to occur. The role of extension personnel has evolved to meet the increasingly complex issues within social, economic, and political environments (Morse et al., 2006). Extension personnel are tasked with continuously assisting community members through different needs as extension continues to evolve as the demands of the community shift. It is important to evaluate the current roles of extension personnel through their experience in training, communication with elected officials, personal and professional needs, and communication with other agencies and community members during and after the natural disaster.

Responsibilities were not outlined until the disaster occurred. Extension personnel reported to respond to needs within the community as they received their assignments from extension leadership. There should be a distinction between emergency responders and recovery facilitators because extension personnel need a clear outline of their role within disaster relief. Extension personnel need to know how to work with other agencies that are emergency responders or recovery facilitators so there

is not a waste of resources and an overlap in reporting. Understanding the changing role extension personnel experience amidst disasters will assist in preparing agents and the agency in preparing and responding to future disasters.

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APPENDIX A

RQ1. *What were the personal and occupational needs of extension personnel after natural disasters?*

RO1. Describe extension professionals' personal needs.

Recode 1.1: recode to assess extension professionals' damage to home or other personal hardships. The root variable was PersNeed_Extent_1 from Hurricane Irma, Q17 from Hurricane Harvey, and Q18 from Texas Panhandle was recoded into a new variable, J001_01. The new variable's labels were: 0 = Not at all, 1 = Slight or greater.

Recode 1.2: recode to assess personal stress or emotional symptoms while involved in hurricane preparation and relief efforts. The root variable was PersNeed_Extent_2 from Hurricane Irma and was recoded to J001_02. The new variable's labels were: 0 = Not at all, 1 = Slight or greater.

Recode 1.3: recode to assess Hurricane Irma affecting job performance, such as having trouble concentrating or missing work. The root variable was PersNeed_Extent_3 and was recoded to J001_03. The new variable's labels were: 0 = Not at all, 1 = Slight or greater.

Recode 1.4: recode to assess if extension personnel had a source of support for their own emotional needs. The root variable was PersNeed_Extent_4 and was recoded to J001_04. The new variable's labels: were 0 = Not at all, 1 = Slight or greater.

Recode 1.5: recode to assess if extension personnel had a source of support for their own physical needs (e.g. shelter, food, water, electricity). The root variable was PersNeed_Extent_5 and was recoded to J001_05. The new variable's labels were: 0 = Not at all, 1 = Slight or greater.

Recode 1.6: recode to assess the person or agency extension personnel turned to for support for their emotional needs. The root variable was PersNeed_Emotion_Text and was recoded to J001_06. The new variable's labels were: 1 = Family; 2 = Friends; 3 = Church; 4 = Local government; 5 = Extension peers; 6 = Other.

Recode 1.7: recode to assess the person or agency extension personnel turned to for support of their physical needs (e.g. shelter, food, water, electricity). The root variable was PersNeed_Physical_Text and was recoded to J001_07. The new variable's labels were: 1 = Family; 2 = Friends; 3 = Church; 4 = Extension office; 5 = No one/myself; 6 = Other.

Recode 1.8: recode to assess any additional comments regarding personal needs extension personnel had during the 2017 hurricane season. The root variable was PersNeed_Other_Text and was recoded to J001_08. The new variable's labels were: 1 = Lack of resources, 2 = Stress from disaster, 3 = Power outages; 4 = Other.

RO2. Describe extension professionals' occupational needs.

Recode 2.1: recode to assess the first greatest professional challenge extension personnel faced as a result of the 2017 hurricane. The root variable was ProfNeed_Challenge1 and was recoded to J002_01. The new variable's labels were: 1 =

No internet; 2 = Power outages; 3 = Work life balance; 4 = Lack of communication; 5 = Other.

Recode 2.2: recode to assess the second greatest professional challenge extension personnel faced as a result of the 2017 hurricane. The root variable was ProfNeed_Challenge2 and was recoded to J002_02. The new variable's labels were: 1 = No internet; 2 = Power outages; 3 = Work life balance; 4 = Lack of communication; 5 = Other.

Recode 2.3: recode to assess the first greatest professional challenge extension personnel faced as a result of the 2017 hurricane. The root variable was ProfNeed_Challenge3 and was recoded to J002_03. The new variable's labels were: 1 = No internet; 2 = Power outages; 3 = Work life balance; 4 = Lack of communication; 5 = Other.

Recode 2.4: recode to assess the extent extension personnel were prepared to address the professional challenges they faced. The root variable was ProfNeed_Extent_1 and was recoded to J002_04. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.5: recode to assess the extent clientele extension personnel assisted exhibited stress or emotional symptoms. The root variable was ProfNeed_Extent_2 and was recoded to J002_05. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.6: recode to assess the level of difficulty extension personnel faced balancing personal and professional needs. The root variable was ProfNeed_Extent_3

and was recoded to J002_06. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.7: recode to assess how extension personnel addressed clientele's needs who were experiencing stress or emotional symptoms. The root variable was ProfNeed_Stress_Text and was recoded to J002_07. The new variable's labels were: 1 = Support through phone; 2 = Listened; 3 = Site visits; 4 = None; 5 = Other.

Recode 2.8: recode to assess extension personnel's most difficult challenges when balancing personal and professional needs. The root variable was ProfNeed_Balance_Text and was recoded to J002_08. The new variable's labels were: 1 = Taking care of family; 2 = Long shifts; 3 = Fixing home; 4 = Challenges getting to office; 5 = Lack of communication; 6 = Other.

Recode 2.9: recode to assess the extent extension personnel needed professional development in working with the media in preparation to hurricanes. The root variable was ProfDev_Hurricane_1 and was recoded to J002_09. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.10: recode to assess the extent extension personnel needed professional development in coping with personal stress in preparation to hurricanes. The root variable was ProfDev_Hurricane_2 and was recoded to J002_10. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.11: recode to assess the extent extension personnel needed professional development in helping coworkers cope with stress in preparation to hurricanes. The root

variable was ProfDev_Hurricane_3 and was recoded to J002_11. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.12: recode to assess the extent extension personnel needed professional development in helping clientele cope with stress in preparation to hurricanes. The root variable was ProfDev_Hurricane_4 and was recoded to J002_12. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.13: recode to assess the extent extension personnel needed professional development in addressing personal needs (emotional and physical needs) in preparation to hurricanes. The root variable was ProfDev_Hurricane_5 and was recoded to J002_13. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.14: recode to assess the extent extension personnel needed professional development in hurricane disaster preparedness. The root variable was ProfDev_Hurricane_6 and was recoded to J002_14. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.15: recode to assess the extent extension personnel needed professional development in hurricane disaster recovery. The root variable was ProfDev_Hurricane_7 and was recoded to J002_15. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.16: recode to assess the extent extension personnel need professional development in applying their subject matter in disaster situations in preparation for hurricanes. The root variable was ProfDev_Hurricane_8 and was recoded to J002_16. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.17: recode to assess the extent extension personnel need professional development in other areas that were not previously listed in preparation for hurricanes. The root variable was ProfDev_Hurricane_9 and was recoded to J002_17. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.18: recode to assess the other areas where extension personnel need professional development in preparation for hurricanes. The root variable was ProfDev_Hurricane_TEXT and was recoded to J002_18. The new variable's labels were: 1 = Centralized website; 2 = Clear job roles; 3 = Time off to prepare.

Recode 2.19: recode to assess the extent extension personnel needed professional development in working with the media in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_1 for Hurricane Irma and Q28A for Texas Panhandle and was recoded to J002_19. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.20: recode to assess the extent extension personnel needed professional development in coping with personal stress in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_2 for Hurricane Irma and Q28B for Texas Panhandle and was recoded to J002_20. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.21: recode to assess the extent extension personnel needed professional development in helping coworkers cope with stress in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was

ProfDev_Emergency_3 for Hurricane Irma and Q28C for Texas Panhandle and was recoded to J002_21. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.22: recode to assess the extent extension personnel needed professional development in helping clientele cope with stress in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_4 for Hurricane Irma and was recoded to Q28D for Texas Panhandle and was recoded to J002_22. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.23: recode to assess the extent extension personnel needed professional development to address their personal needs (emotional and physical needs) in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_5 for Hurricane Irma and Q28E for Texas Panhandle and was recoded to J002_23. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.24: recode to assess the extent extension personnel needed professional development in hurricane disaster preparedness in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_6 for Hurricane Irma and Q28F for Texas Panhandle and was recoded to J002_24. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.25: recode to assess the extent extension personnel needed professional development in hurricane disaster recovery in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_7 for

Hurricane Irma and Q28G for Texas Panhandle and was recoded to J002_25. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.26: recode to assess the extent extension personnel needed professional development in applying their subject matter in disaster situations in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_8 and was recoded to J002_26. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.27: recode to assess the extent extension personnel needed professional development other areas in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_9 and was recoded to J002_27. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.28: recode to assess other areas extension personnel needed professional development that were not previously listed in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable was ProfDev_Emergency_TEXT and was recoded to J002_28. The new variable's labels were: 1 = Job clarity and roles; 2 = Navigating website to find resources.

Recode 2.29: recode to assess how likely extension personnel would be to attend or participate in statewide conferences in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_1 for Hurricane Irma and Q29A for Texas Panhandle and was recoded to J002_29. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.30: recode to assess how likely extension personnel would be to attend or participate in district meetings in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_2 for Hurricane Irma and Q29B for Texas Panhandle and was recoded to J002_30. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.31: recode to assess how likely extension personnel would be to attend or participate in web-based modules/CD-ROM in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_3 for Hurricane Irma and Q29C for Texas Panhandle and was recoded to J002_31. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.32: recode to assess how likely extension personnel would be to attend or participate in telephone conferences in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_4 for Hurricane Irma and Q29D for Texas Panhandle and was recoded to J002_32. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.33: recode to assess how likely extension personnel would be to attend or participate in video conferences in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_5 for Hurricane Irma and Q29E for Texas Panhandle and was recoded to J002_33. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.34: recode to assess how likely extension personnel would be to attend or participate in print materials in preparation for hurricanes or other emergency

situations. The root variable was ProfTrain_Hurricane_6 for Hurricane Irma and Q29F for Texas Panhandle and was recoded to J002_34. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.35: recode to assess how likely extension personnel would be to attend or participate in Facebook live in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_7 for Hurricane Irma and Q29G for Texas Panhandle and was recoded to J002_35. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.36: recode to assess how likely extension personnel would be to attend or participate in social media updates in preparation for hurricanes or other emergency situations. The root variable was ProfTrain_Hurricane_8 for Hurricane Irma and Q29H for Texas Panhandle and was recoded to J002_36. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.37: recode to assess how likely extension personnel would be to attend or participate in statewide conferences in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_1 and was recoded to J002_37. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.38: recode to assess how likely extension personnel would be to attend or participate in district meetings in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_2 and was recoded to J002_38. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.39: recode to assess how likely extension personnel would be to attend or participate in web-based modules/CD-ROM in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_3 and was recoded to J002_39. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.40: recode to assess how likely extension personnel would be to attend or participate in telephone conferences in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_4 and was recoded to J002_40. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.41: recode to assess how likely extension personnel would be to attend or participate in video conferences in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_5 and was recoded to J002_41. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.42: recode to assess how likely extension personnel would be to attend or participate in print materials in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_6 and was recoded to J002_42. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.43: recode to assess how likely extension personnel would be to attend or participate in Facebook live in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_7 and was recoded to J002_43. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.44: recode to assess how likely extension personnel would be to attend or participate in social media updates in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.). The root variable is ProfTrain_Emergency_8 and was recoded to J002_44. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 2.45: recode to assess additional comments provided regarding professional needs extension personnel had during the 2017 hurricane season. The root variable is ProfNeed_Other_TEXT for Hurricane Irma was recoded to J002_45. Q21 for Hurricane Harvey and Q26 Texas Panhandle were recoded to J002_45_1. Q22 for Hurricane Harvey and Q27 for Texas Panhandle were recoded to J002_45_2. The new variable's labels were: 1 = Knowing where to access information/identifying resources for community members; 2 = Training; 3 = Communication; 4 = Other; 5 = None.

Recode 2.46: recode to assess extension personnel's agreement that this role can be used in the context of an emergency or in other counties. The root variable is Q18A for Hurricane Harvey and Q19A for Texas Panhandle and was recoded to J002_46. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.47: recode to assess extension personnel's agreement that this structure can be used in other disaster emergencies or other responders. The root variable is Q18B for Hurricane Harvey and Q19B for Texas Panhandle and was recoded to J002_47. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.48: recode to assess extension personnel's agreement that they recommend using this protocol in the event of another natural disaster/emergency. The root variable is Q18C for Hurricane Harvey and Q19C for Texas Panhandle and was recoded to J002_47. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.49: recode to assess extension personnel's agreement that this role can be used as part of the daily activities of a county agent. The root variable is Q18D for Hurricane Harvey and Q19D for Texas Panhandle and was recoded to J002_49. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.50: recode to assess extension personnel's agreement that they were prepared to take on a new role when dealing with the aftermath of Hurricane Harvey or the 2017 wildfires. The root variable is Q19A for Hurricane Harvey and Q20A for Texas Panhandle and was recoded to J002_50. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.51: recode to assess extension personnel's agreement that if emergency preparation becomes part of their permanent job description, then there will be a need to add additional agents to their county specifically for emergency preparation. The root variable is Q19B for Hurricane Harvey and Q20B for Texas Panhandle and was recoded

to J002_51. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.52: recode to assess extension personnel's agreement that extension can prepare future agents for emergency situations with formal training at the university level. The root variable is Q19C for Hurricane Harvey and Q20C for Texas Panhandle and was recoded to J002_52. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 2.53: recode to assess how often extension personnel received training for Rebuild Texas or wildfires. The root variable is Q20 for Hurricane Harvey and Q24 for Texas Panhandle and was recoded to J002_53. The new variable's labels were: 1 = Weekly, 2 = Bi-Weekly, 3 = Monthly, 4 = When it was needed; 5 = Did not receive any training.

Recode 2.54: recode to assess what type of natural disaster training extension personnel received (e.g. wildfire, flooding, wind damage, earthquake). The root variable is Q25 for Texas Panhandle and was recoded to J002_54. The new variable's labels were: 1 = Wildfire, 2 = Hurricane, 3 = Other.

RQ2. *What communication channels were being used by extension professionals after natural disasters?*

Recode 3.1: recode used to assess to what extent extension personnel made use of mass media channels to communicate during the 2017 hurricane season. The root

variable is ComEffort_Personal and was recoded to J003_01. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.2: recode used to assess to what extent extension personnel's local Extension office made use of mass media channels to communicate during the recent hurricanes. The root variable is ComEffort_Office and was recoded to J003_02. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.3: recode used to assess to what extent extension personnel believe the general public was aware of Extension's efforts during the recent hurricanes. The root variable is ComAware_Public and was recoded to J003_03. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.4: recode used to assess to what extent extension personnel believe their Extension clientele group was aware of Extension's efforts during the recent hurricanes. The root variable is ComAware_Clientele and was recoded to J004_04. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.5: recode used to assess to what extent extension personnel's Extension office used flyers, print materials to convey information to the public during recent hurricanes. The root variable is ComSource_1 and was recoded to J004_05. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.6: recode used to assess to what extent extension personnel's Extension office used the newspaper to convey information to the public during recent hurricanes. The root variable is ComSource_2 and was recoded to J004_06. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.7: recode used to assess to what extent extension personnel's Extension office used radio public service announcements to convey information to the public during recent hurricanes. The root variable is ComSource_3 and was recoded to J004_07. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.8: recode used to assess to what extent extension personnel's Extension office used live radio interviews to convey information to the public during recent hurricanes. The root variable is ComSource_4 and was recoded to J004_08. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.9: recode used to assess to what extent extension personnel's Extension office used TV public service announcements to convey information to the public during recent hurricanes. The root variable is ComSource_5 and was recoded to J004_09. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.10: recode used to assess to what extent extension personnel's Extension office used live TV interviews to convey information to the public during recent hurricanes. The root variable is ComSource_6 and was recoded to J004_010. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.11: recode used to assess to what extent extension personnel's Extension office used the Internet/web to convey information to the public during recent hurricanes. The root variable is ComSource_7 and was recoded to J004_011. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.12: recode used to assess which communication source/channels extension personnel used were most effective in conveying information to the public

during the recent hurricanes. The root variable is ComEffect_Public and was recoded to J004_12. The new variable's labels were: 1 = Flyers, print materials; 2 = Newspaper; 3 = Radio public service announcements; 4 = Live radio interviews; 5 = TV public service announcements; 6 = Live TV interviews; 7 = Internet/Web; 8 = Other.

Recode 3.13: recode used to assess other communication source/channels extension personnel used as the most effective method to convey information to the public during the recent hurricanes. The root variable is ComEffective_Pub_TEXT for Hurricane Irma and Q15 for Texas Panhandle and was recoded to J003_13. The new variable's labels were: 1 = Social media; 2 = Television; 3 = Direct e-mails; 4 = Unsure; 5 = Other.

Recode 3.14: recode used to assess what messages extension personnel were trying to get across to the public during the recent hurricane. The root variable is MessagePub_TEXT and was recoded to J003_14. The new variable's labels were: 1 = Assistance with shelter; 2 = Assistance with clean up; 3 = Food safety; 4 = Urban forest management; 5 = Did not connect with public; 6 = Other.

Recode 3.15: recode used to assess to what extent extension personnel used social media to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_1 and was recoded to J003_15. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.16: recode used to assess to what extent extension personnel used Facebook to convey information to their extension clientele group during the recent

hurricane. The root variable is ComUse_2 and was recoded to J003_16. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.17: recode used to assess to what extent extension personnel used Twitter to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_3 and was recoded to J003_17. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.18: recode used to assess to what extent extension personnel used Instagram to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_4 and was recoded to J003_18. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.19: recode used to assess to what extent extension personnel used the Internet to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_5 and was recoded to J003_19. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.20: recode used to assess to what extent extension personnel used face to face visits to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_6 and was recoded to J003_20. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.21: recode used to assess to what extent extension personnel used on-site visits to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_7 and was recoded to J003_21. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.22: recode used to assess to what extent extension personnel used the phone to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_8 and was recoded to J003_22. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.23: recode used to assess to what extent extension personnel used text messaging to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_9 and was recoded to J003_23. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.24: recode used to assess to what extent extension personnel used electronic mail (e-mail) to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_10 and was recoded to J003_24. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.25: recode used to assess to what extent extension personnel used other methods to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_11 and was recoded to J003_25. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.26: recode used to assess to what methods extension personnel used to convey information to their extension clientele group during the recent hurricane. The root variable is ComUse_Other_TEXT and was recoded to J003_26. The new variable's labels were: 1 = Electronic; 2 = Non electronic; 3 = None.

Recode 3.27: recode used to assess to what extent extension personnel's local Extension office made use of social media to communicate to clientele during the recent

hurricane. The root variable is ComUseExt_1 and was recoded to J003_27. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.28: recode used to assess to what extent extension personnel's local Extension office made use of Facebook to communicate to clientele during the recent hurricane. The root variable is ComUseExt_2 and was recoded to J003_28. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.29: recode used to assess to what extent extension personnel's local Extension office made use of Twitter to communicate to clientele during the recent hurricane. The root variable is ComUseExt_3 and was recoded to J003_29. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.30: recode used to assess to what extent extension personnel's local Extension office made use of Instagram to communicate to clientele during the recent hurricane. The root variable is ComUseExt_4 and was recoded to J003_30. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.31: recode used to assess to what extent extension personnel's local Extension office made use of the Internet to communicate to clientele during the recent hurricane. The root variable is ComUseExt_5 and was recoded to J003_31. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.32: recode used to assess to what extent extension personnel's local Extension office made use of face to face visits to communicate to clientele during the recent hurricane. The root variable is ComUseExt_6 and was recoded to J003_32. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.33: recode used to assess to what extent extension personnel's local Extension office made use of on-site visits to communicate to clientele during the recent hurricane. The root variable is ComUseExt_7 and was recoded to J003_33. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.34: recode used to assess to what extent extension personnel's local Extension office made use of the phone to communicate to clientele during the recent hurricane. The root variable is ComUseExt_8 and was recoded to J003_34. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.35: recode used to assess to what extent extension personnel's local Extension office made use of text messaging to communicate to clientele during the recent hurricane. The root variable is ComUseExt_9 and was recoded to J003_35. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.36: recode used to assess to what extent extension personnel's local Extension office made use of electronic mail (e-mail) to communicate to clientele during the recent hurricane. The root variable is ComUseExt_10 and was recoded to J003_36. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.37: recode used to assess other methods that extent extension personnel's local Extension office used to communicate to clientele during the recent hurricane. The root variable is ComUseExt_11 and was recoded to J003_37. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 3.38: recode used to assess other methods that were not previously listed that the extension personnel's local Extension office used to communicate to clientele

during the recent hurricane. The root variable is ComeUseExt_Other_TEXT and was recoded to J003_38. The new variable's labels were: 1 = Personal contacts; 2 = Social media; 3 = None; 4 = Other.

Recode 3.39: recode used to assess the messages extension personnel were trying to get across to their Extension clientele group during the recent hurricane. The root variable is MessageClientle_TEXT and was recoded to J003_40. The new variable's labels were: 1 = Access to resources; 2 = Damage assessment; 3 = Preparation; 4 = Communication; 5 = Other.

Recode 3.40: recode used to assess if extension personnel's office has an internal plan to manage communication efforts in a crisis such as hurricanes or other emergency situations. The root variable is ComMgmt_Internal and was recoded to J003_41. The new variable's labels were: 1 = Yes; 2 = No.

Recode 3.41: recode used to assess if extension personnel's office has an external plan to manage communication efforts in a crisis such as hurricanes or other emergency situations. The root variable is ComMgmt_External and was recoded to J003_42. The new variable's labels were: 1 = Yes; 2 = No.

Recode 3.42: recode used to assess how extension personnel communicate with elected officials. The root variable is Q9 for Hurricane Harvey and Q8 for Texas Panhandle and was recoded to J003_43. The new variable's labels were: 1 = E-mails; 2 = Text messages; 3 = Phone calls; 4 = In-person visits; 5 = Other.

Recode 3.43: recode used to assess other ways extension personnel communicated with elected officials. The root variable is Q9_5_TEXT for Hurricane

Harvey and Q9 for Texas Panhandle. The new variable's labels were: 1 = Designated contacts; 2 = Non-elected officials.

Recode 3.47: recode used to assess if communication from Extension leadership has been effective. The root variable is Q10 for Hurricane Harvey and Q10 for Texas Panhandle and was recoded to J003_49. The new variable's labels were: 1 = Current issues; 2 = Infrastructure; 3 = Progress updates; 4 = None; 5 = Other.

Recode 3.48: recode used to assess why extension personnel believed why or why not communication with extension leadership has been effective. The root variable is Q23 for Hurricane Harvey and Q30 for Texas Panhandle and was recoded to J003_50. The new variable's labels were: 1 = Yes; 2 = No.

Recode 3.49: recode used to assess if extension personnel receive communication from community members about their work in correlation to hurricanes or wildfires. The root variable is Q24 for Hurricane Harvey and Q31 for Texas Panhandle and was recoded to J003_51. The new variable's labels were: 1 = Email; 2 = Text messages; 3 = Phone calls; 4 = In-person visits; 5 = Other.

Recode 3.50: recode used to assess if communication has been effective in this role. The root variable is Q25 for Hurricane Harvey and Q32 for Texas Panhandle and was recoded to J003_57. The new variable's labels were: 1 = Yes; 2 = No.

Recode 3.51: recode used to assess why communication has not been effective. The root variable is Q26 for Hurricane Harvey and Q33 for Texas Panhandle and was recoded to J003_58. The new variable's labels were: 1 = Communication was timely and effective; 2 = Communication was ineffective and lacked detail.

Recode 3.52: recode used to assess what types of information was communicated to extension personnel by community members in correlation to hurricanes or wildfires. The root variable is Q28 for Hurricane Harvey and Q35 for Texas Panhandle and was recoded to J003_60. The new variable's labels were: 1 = Needs of people; 2 = Needs of animals; 3 = None.

RQ3. *What forms of technology were being used by extension professionals after natural disasters?*

Recode 4.01: recode used to assess the type of technology extension personnel personally used during Hurricane Irma. The root variable is Tech_Use and was recoded to J004_01. The new variable's labels were: 1 = Smart phone; 2 = Cell phone; 3 = Tablet; 4 = Laptop computer; 5 = Wireless cellular hotspot; 6 = Desktop computer; 7 = Other.

Recode 4.02: recode used to assess other forms of technology extension personnel personally used during Hurricane Irma. The root variable is TechUse_7_TEXT and was recoded to J004_08. The new variable's labels were: 1 = Radio; 2 = Smart phone; 3 = Television.

Recode 4.03: recode used to assess any special software or applications (apps) that extension personnel personally used during the recent hurricanes (e.g. GroupMe, Facebook Messenger, Zello, Voxer, etc.). The root variable is Tech_AppUse and was recoded to J004_09. The new variable's labels were: 1 = Facebook; 2 = GroupMe; 3 = Other.

Recode 4.04: recode used to assess how long extension personnel were without power at their Extension office following Hurricane Irma. The root variable is ExtPower and was recoded to J004_10. The new variable's labels were: 1 = 1-2 days; 2 = 3-6 days; 3 = 1 week or longer.

Recode 4.05: recode used to assess how long extension personnel were personally without power following Hurricane Irma. The root variable is ResPower and was recoded to J004_11. The new variable's labels were: 1 = 1-2 days, 2 = 3-6 days; 3 = 1-2 weeks; 4 = 2 weeks or more; 5 = None.

Recode 4.06: recode was used to assess if extension personnel personally lost cellular service. The root variable is CellLoss and was recoded to J004_12. The new variable's labels were: 1 = Yes; 2 = No.

Recode 4.07: recode was used to assess how long extension personnel were personally without cellular service. The root variable is CellLoss_Duration and was recoded to J004_13. The new variable's labels were: 1 = 1-2 days; 2 = 3-6 days; 3 = 1-2 weeks; 4 = None.

Recode 4.08: recode was used to assess if extension personnel thought the reporting app was easy to use. The root variable is Q29A for Hurricane Harvey and was recoded to J004_14. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 4.09: recode was used to assess if extension personnel thought reporting in general was easy. The root variable is Q29B for Hurricane Harvey and was recoded to

J004_15. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 4.10: recode was used to assess if extension personnel thought the amount of time reporting was necessary. The root variable is Q29C for Hurricane Harvey and was recoded to J004_16. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 4.11: recode was used to assess if extension personnel thought that daily reporting was not a big issue. The root variable is Q29D for Hurricane Harvey and was recoded to J004_17. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

Recode 4.12: recode was used to assess if extension personnel agreed with the statement that they would like to use a similar app-based approach to other reporting requirements. The root variable is Q29E for Hurricane Harvey and was recoded to J004_18. The new variable's labels were: 1 = Strongly disagree; 2 = Somewhat disagree; 3 = Neither agree nor disagree; 4 = Somewhat agree; 5 = Strongly agree.

RQ4. *What forms of intra-organizational coordination were being used by extension professionals after natural disasters?*

RO3. Describe educational programs currently utilized.

Recode 5.01: used to assess if extension personnel conducted any educational programs related to hurricanes or other emergency situations in 2017. The root variable

is EdProgram and was recoded to J005_01. The new variable's labels were: 1 = Yes; 2 = No.

Recode 5.02: used to assess to what extent there was a coordinated organizational response at the county level from Extension during the 2017 hurricane. The root variable is OrgCoord_County and was recoded to J005_04. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 5.03: used to assess to what extent there was a coordinated organizational response at the district level from Extension during the 2017 hurricane. The root variable is OrgCoord_District and was recoded to J005_05. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 5.04: used to assess to what extent there was a coordinated organizational response at the state level from Extension during the 2017 hurricane. The root variable is OrgCoord_State and was recoded to J005_06. The new variable's labels were: 0 = Not at all; 1 = Slight or greater.

Recode 5.05: used to assess if Extension is a member of their community's emergency response action plan. The root variable is EmResponse and was recoded to J005_11. The new variable's labels were: 1 = Yes; 2 = No.

RO4. Describe extension's educational program effectiveness amidst natural disasters.

Recode 5.06: used to assess extension's educational program effectiveness amidst natural disasters at the county level. The root variable is ExtResponse_County

and was recoded to J005_07. The new label's variables were: 0 = Not at all; 1 = Slight or greater.

Recode 5.07: used to assess extension's educational program effectiveness amidst natural disasters at the district level. The root variable is ExtResponse_District and was recoded to J005_08. The new label's variables were: 0 = Not at all; 1 = Slight or greater.

Recode 5.08: used to assess extension's educational program effectiveness amidst natural disasters at the state level. The root variable is ExtResponse_State and was recoded to J005_09. The new label's variables were: 0 = Not at all; 1 = Slight or greater.

RO5. Describe suggestions for future programs.

Recode 5.09: used to assess what types of educational programs Extension should conduct prior to the emergency situation, in relation to hurricanes or other emergency situations. The root variable is EdProg_Prior and was recoded to J005_02. The new label's variables were: 1 = Government programs; 2 = Disaster preparation programs; 3 = Other; 4 = None.

Recode 5.10: used to assess what types of educational programs Extension should conduct after the emergency situation, in relation to hurricanes or other emergency situations. The root variable is EdProg_After and was recoded to J005_03. The new label's variables were: 1 = Government programs; 2 = Safety and clean up; 3 = Other; 4 = None.

Recode 5.11: used to assess any further recommendations for how the Florida Cooperative Extension Service can coordinate efforts during the hurricanes and other emergency situations. The root variable is OrgCoord_Recs for Hurricane Irma and was recoded to J005_10. The root variable is Q21 for Texas Panhandle and was recoded to J005_10_1. The root variable is Q36 for Texas Panhandle and was recoded to J005_10_2. The new label's variables were: 1 = Plan of action; 2 = Partner with government programs; 3 = Funding; 4 = Communication; 5 = Other.

Recode 5.12: used to assess if extension is a member of their community emergency response action plan. The root variable is EmResponse for Hurricane Irma and was recoded to J005_11. The new label's variables were: 1 = Yes; 2 = No; 3 = I don't know.

***RQ5**. What agencies did extension professionals access or contact before, during, and /or after a natural disaster?*

Recode 6.01: used to assess the extent extension personnel accessed or contacted County Emergency Management to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_1 for Hurricane Irma and Q36A for Texas Panhandle and was recoded to J006_01. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.02: used to assess the extent extension personnel accessed or contacted County Fire/Rescue to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_2 for Hurricane Irma and Q36B for

Texas Panhandle and was recoded to J006_02. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.03: used to assess the extent extension personnel accessed or contacted local law enforcement to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_3 for Hurricane Irma and Q36C for Texas Panhandle and was recoded to J006_03. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.04: used to assess the extent extension personnel accessed or contacted County Road Department to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_4 for Hurricane Irma and Q36D for Texas Panhandle and was recoded to J006_04. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.05: used to assess the extent extension personnel accessed or contacted County &/or City Public Works Department to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_5 for Hurricane Irma and Q36E for Texas Panhandle and was recoded to J006_05. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.06: used to assess the extent extension personnel accessed or contacted County &/or City Solid Waste Department to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_6 for Hurricane Irma and Q36F for Texas Panhandle and was recoded to J006_06. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.07: used to assess the extent extension personnel accessed or contacted County Health Department to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_7 for Hurricane Irma and Q36G for Texas Panhandle and was recoded to J006_07. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.08: used to assess the extent extension personnel accessed or contacted local/regional utilities (electric, gas) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_8 for Hurricane Irma and Q36H for Texas Panhandle and was recoded to J006_08. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.09: used to assess the extent extension personnel accessed or contacted a telephone company to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Local_09 for Hurricane Irma and Q36I for Texas Panhandle and was recoded to J006_09. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.11: used to assess the extent extension personnel accessed or contacted Florida Department of Health to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_State_1 and was recoded to J006_12. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.12: used to assess the extent extension personnel accessed or contacted Florida Department of Transportation to do their job more effectively before, during, and

after the recent hurricanes. The root variable is Resource_State_2 and was recoded to J006_13. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.13: used to assess the extent extension personnel accessed or contacted Florida Department of Agricultural and Consumer Sciences, Division of Consumer Sciences to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDACS_1 and was recoded to J006_14. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.14: used to assess the extent extension personnel accessed or contacted Florida Department of Agricultural and Consumer Sciences, Division of Animal Industry to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDACS_2 and was recoded to J006_15. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.15: used to assess the extent extension personnel accessed or contacted Florida Department of Agricultural and Consumer Sciences, Division of Forestry to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDACS_3 and was recoded to J006_16. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.16: used to assess the extent extension personnel accessed or contacted Florida Department of Agricultural and Consumer Sciences, Division of Plan Industry to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDACS_4 and was recoded to J006_17. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.17: used to assess the extent extension personnel accessed or contacted Florida Department of Agricultural and Consumer Sciences, Office of Bio & Food Security Preparedness to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDACS_5 and was recoded to J006_18. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.18: used to assess the extent extension personnel accessed or contacted Florida Department of Community Affairs, division of Emergency Management to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDCA_1 and was recoded to J006_19. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.19: used to assess the extent extension personnel accessed or contacted Florida Department of Community Affairs, division of Housing and Community Development to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDCA_2 and was recoded to J006_20. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.20: used to assess the extent extension personnel accessed or contacted Florida Department of Environmental Protection, division of Water Management District to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDEP_1 and was recoded to J006_21. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.21: used to assess the extent extension personnel accessed or contacted Florida Department of Environmental Protection, division of Housing and Community

Development to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FDEP_2 and was recoded to J006_22. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.22: used to assess the extent extension personnel accessed or contacted University of Florida, UF/IFAS to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_UF_1 and was recoded to J006_23. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.23: used to assess the extent extension personnel accessed or contacted University of Florida, Health Science Center to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_UF_2 and was recoded to J006_24. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.24: used to assess the extent extension personnel accessed or contacted the U.S. Environmental Protection Agency (EPA) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Federal_1 and was recoded to J006_25. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.25: used to assess the extent extension personnel accessed or contacted the U.S. Occupational Safety & Health Administration (OSHA) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Federal_2 and was recoded to J006_26. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.26: used to assess the extent extension personnel accessed or contacted the U.S. Army Corps of Engineers to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_Federal_3 and was recoded to J006_27. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.27: used to assess the extent extension personnel accessed or contacted the U.S. Department of Agriculture, Farm Service Agency (FSA) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_USDA_1 and was recoded to J006_28. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.28: used to assess the extent extension personnel accessed or contacted the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_USDA_2 and was recoded to J006_29. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.29: used to assess the extent extension personnel accessed or contacted the U.S. Department of Agriculture, Rural Development (RD) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_USDA_1 and was recoded to J006_30. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.30: used to assess the extent extension personnel accessed or contacted the U.S. Department of Agriculture, Animal and Plant Inspection Services (APHIS) to do their job more effectively before, during, and after the recent hurricanes. The root

variable is Resource_USDA_4 and was recoded to J006_31. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.31: used to assess the extent extension personnel accessed or contacted the U.S. Department of Health and Human Services, Federal Emergency Management Agency (FEMA) to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_FEMA and was recoded to J006_32. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.32: used to assess the extent extension personnel accessed or contacted the National Oceanic and Atmospheric Association (NOAA), National Weather Service to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_NOAA_1 and was recoded to J006_33. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.33: used to assess the extent extension personnel accessed or contacted the National Oceanic and Atmospheric Association (NOAA), National Hurricane Center to do their job more effectively before, during, and after the recent hurricanes. The root variable is Resource_NOAA_2 and was recoded to J006_34. The new variable's labels are: 0 = Not at all; 1 = Slight or greater.

Recode 6.34: used to assess the percent of time per week (0 minimum to 100 percent maximum) prior to Hurricane Harvey or the 2017 wildfires extension personnel spent connecting with the Commissioners' court. The root variable is Q7A for Hurricane Harvey and Q6A for Texas Panhandle and were recoded to J006_35. The original coding

was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.35: used to assess the percent of time per week (0 minimum to 100 percent maximum) prior to Hurricane Harvey or the 2017 wildfires extension personnel spent connecting with mayors. The root variable is Q7B for Hurricane Harvey and Q6B for Texas Panhandle and was recoded to J006_36. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.36: used to assess the percent of time per week (0 minimum to 100 percent maximum) prior to Hurricane Harvey or the 2017 wildfires extension personnel spent connecting with school officials. The root variable is Q7C for Hurricane Harvey and Q6C for Texas Panhandle and was recoded to J006_37. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.37: used to assess the percent of time per week (0 minimum to 100 percent maximum) prior to Hurricane Harvey or the 2017 wildfires extension personnel spent reporting data. The root variable is Q7D for Hurricane Harvey and Q6D for Texas Panhandle and was recoded to J006_38. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.38: used to assess the percent of time per week (0 minimum to 100 percent maximum) prior to Hurricane Harvey or the 2017 wildfires extension personnel

spent dealing with issues outside normal content area(s). The root variable is Q7E for Hurricane Harvey and Q6E for Texas Panhandle and was recoded to J006_39. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.39: used to assess the percent of time per week (0 minimum to 100 percent maximum) after Hurricane Harvey or the 2017 wildfires extension personnel spent connecting with Commissioners' court. The root variable is Q8A for Hurricane Harvey and Q7A for Texas Panhandle and was recoded to J006_40. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.40: used to assess the percent of time per week (0 minimum to 100 percent maximum) after Hurricane Harvey or the 2017 wildfires extension personnel spent connecting with mayors. The root variable is Q8B for Hurricane Harvey and Q7B for Texas Panhandle and was recoded to J006_41. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.41: used to assess the percent of time per week (0 minimum to 100 percent maximum) after Hurricane Harvey or the 2017 wildfires extension personnel spent connecting with school officials. The root variable is Q8C for Hurricane Harvey and Q7C for Texas Panhandle and was recoded to J006_42. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.42: used to assess the percent of time per week (0 minimum to 100 percent maximum) after Hurricane Harvey or the 2017 wildfires extension personnel spent reporting data. The root variable is Q8D for Hurricane Harvey and Q7D for Texas Panhandle and was recoded to J006_43. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.43: used to assess the percent of time per week (0 minimum to 100 percent maximum) after Hurricane Harvey or the 2017 wildfires extension personnel spent dealing with issues outside normal content area(s). The root variable is Q8E for Hurricane Harvey and Q7E for Texas Panhandle and was recoded to J006_44. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported frequency and percentage.

Recode 6.44: used to assess if extension personnel's changing role amidst natural disasters has allowed them to connect with people they had not worked with before. The root variable is Q15 for Hurricane Harvey and Q16 for Texas Panhandle and was recoded to J006_50. The new variable's labels are: 1 = Yes; 2 = No.

Recode 6.45: used to assess why extension personnel had not connected with the people they had not worked with before. The root variable is Q16 for Hurricane Harvey and Q17 for Texas Panhandle and was recoded to J006_51. The new variable's labels are: 1 = Did not have similar job descriptions; 2 = Did not have applicable contacts.

Recode 6.46: used to assess if there is any plan or enacted legislation that aims to reduce the impact of wildfires in Texas. The root variable is Q22 for Texas Panhandle and was recoded to J006_52. The new variable's labels are: 1 = Yes; 2 = No.

***RQ6**. What was the impact that extension professionals made in local communities after a natural disaster occurred?*

Recode 7.01: used to assess the success stories extension personnel's county Extension office had with clientele during the recent hurricanes. The root variable is Impact_Success for Hurricane Irma, Q12 for Hurricane Harvey, and Q12 for Texas Panhandle and was recoded to J007_01. The new variable's labels are: 1 = Delivered/volunteered in shelters; 2 = Disaster clean up; 3 = Utilized volunteers; 4 = Dispersed information to community members; 5 = Other.

Recode 7.02: used to assess how extension personnel responded, as an Extension professional, in the hurricane relief efforts in their community. The root variable is Impact_Response and was recoded to J007_02. The new variable's labels are: 1 = Delivered/volunteered in shelters; 2 = Disaster clean up; 3 = Utilized volunteers; 4 = Dispersed information to community members; 5 = Other.

Recode 7.03: used to assess some challenges within extension personnel's new role amidst natural disasters in Texas. The root variable is Q13 for Hurricane Harvey and Q13 for Texas Panhandle and was recoded to J007_04. The new variable's labels are: 1 = Getting connected to the right person; 2 = Lack of communication; 3 = Understanding their role; 4 = Reporting process; 5 = Other.

Recode 7.04: used to assess how extension personnel would improve the challenges within their new role amidst natural disasters in Texas. The root variable is Q14 for Hurricane Harvey and Q14 for Texas Panhandle and was recoded to J007_05. The new variable's labels are: 1 = More training; 2 = Reduce job expectations; 3 = Reduce amount of mandatory reporting; 4 = Other.

RQ7*. What was the damage assessed in local communities by extension professionals after a natural disaster occurred?*

Recode 8.01: used to assess the main source of damage in the extension personnel's county after Hurricane Harvey. The root variable is Q3 for Hurricane Harvey and was recoded to J009_01. The new variable's labels are: 1 = Wind damage; 2 = Storm surge; 3 = Flooding; 4 = Fires; 5 = Other.

Recode 8.02: used to assess the percentage of the county that was impacted after Hurricane Harvey. The root variable is Q4 for Hurricane Harvey and was recoded to J009_03.

Recode 8.3: used to assess the estimated economic impact in their county in dollars. The root variable is Q4 for Texas Panhandle and was recoded to J009_04. The new variable's labels are: 1 = 50-100 thousand dollars; 2 = 101-200 thousand dollars; 3 = 1-10 million dollars; 4 = greater than 10 million dollars; 5 = Other.

Recode 8.4: used to assess a description of the damage in their county. The root variable is Q6 for Hurricane Harvey and Q4 for Texas Panhandle and was recoded to J009_05. The new variable's labels are: 1 = Flooding; 2 = Wind; 3 = Flooding and wind; 4 = Loss of pasture/grazing; 5 = Loss of livestock; 6 = Other; 7 = None.

Recode 8.5: used to assess on average how many hours extension personnel anticipated working on mitigating damage from hurricanes or wildfires within the first month of the event. The root variable is Q11A for Hurricane Harvey and Q11A for Texas Panhandle and was recoded to J009_06. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported mean, standard deviation, minimum, and maximum.

Recode 8.6: used to assess on average how many hours extension personnel anticipated working on mitigating damage from Hurricane Harvey between October 2017 and December 2017. The root variable is Q11B for Hurricane Harvey and was recoded to J009_07. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported mean, standard deviation, minimum, and maximum.

Recode 8.7: used to assess on average how many hours extension personnel anticipated working on mitigating damage from hurricanes or wildfires since January 1, 2018. The root variable is Q11C for Hurricane Harvey and Q11B for Texas Panhandle and was recoded to J009_07. The original coding was consistent in both versions of the questionnaire. Therefore, the unique values were not changed. I reported mean, standard deviation, minimum, and maximum.

Recode 8.8: used to assess on average how many hours extension personnel anticipated working on mitigating damage from hurricanes or wildfires from when they responded to the survey. The root variable is Q11D for Hurricane Harvey and Q11C for Texas Panhandle and was recoded to J009_08. The original coding was consistent in

both versions of the questionnaire. I reported mean, standard deviation, minimum, and maximum.

APPENDIX B

Hurricane Questions 2017/2018

Extension's Involvement and Impact During the 2017 Hurricane Season

Thank you for your willingness to participate in this study. Please read this consent document carefully before deciding to participate in this study.

Purpose of the research study: The aim of this study is to gain a better understanding of UF/IFAS Extension's involvement and impact during the 2017 hurricane season. Your responses will provide valuable information that will help guide Extension's future role in hurricane preparedness and relief efforts, as well as help identify Extension faculty's personal and professional needs. Lastly, the results from this study will be used to develop effective communication, training, curriculum, and resources in preparation for future hurricanes and other emergencies.

Time required: The questionnaire will take approximately 20 minutes to complete.

Risks, Compensation, Voluntary Participation: While your response to this questionnaire is greatly valued, participation is strictly voluntary. Should you choose to participate, you may withdraw from the study at any time without consequence. There are no more than minimal risks associated with this research study. There is no penalty for not participating, nor will there be compensation offered for participating. Your responses are completely confidential and no reference will be made in any oral or written report that would link you to the study.

For any general questions concerning this research study, please contact Angie Lindsey via email at ablindsey@ufl.edu, or by phone at (904)-509-3518. If you have questions about subjects' rights or other concerns, you may contact UFIRB Office at (352) 392-6545, Box 112250, Gainesville FL 32611.

Consent By selecting "I agree to complete the following survey", you are giving your consent to participate in this study. If you do not wish to participate in this study, please select "I do not agree to complete the following survey".

- ○ I agree to complete the following survey
- ○ I do not agree to complete the following survey

Extension Faculty Personal Needs

[PersNeed_1]
Please answer the following questions based on your experiences during the 2017 hurricane season.

	Not at All	Slight Extent	Moderate Extent	Great Extent
To what extent did you experience damage to your home or experience other personal hardships?				
To what extent did you experience personal stress or emotional symptoms while involved in hurricane preparation and relief efforts?				
To what extent did your personal experience affect your job performance – such as having trouble concentrating or missing work?				
To what extent did you have a source of support for your own emotional needs?				
To what extent did you have a source of support for your own physical needs (shelter, food, water, electricity)?				

[PersNeed_2]

To whom (person or agency) did you turn for support of your emotional needs?

_____

[PersNeed_3]

To whom (person or agency) did you turn for support of your physical needs (shelter, food, water, electricity)?

_____

[PersNeed_4]

Please provide any additional comments regarding personal needs you had during the 2017 hurricane season.

Extension Faculty Professional Needs [ProfNeed]

[ProfNeed_1]
List the three (3) greatest professional challenges you faced as a result of the 2017 hurricane.

○ 1 _____

○ 2 _____

○ 3 _____

[ProfNeed_2]
Please answer the following questions based on your experiences during the 2017 hurricane season.

	Not at All	Slight Extent	Moderate Extent	Great Extent
To what extent were you prepared to address the professional challenges that you faced?				
To what extent did clientele that you assisted exhibit stress or emotional symptoms?				
To what extent was it difficult for you to balance personal and professional needs?				

[ProfNeed_3]

If clientele exhibited stress or emotional symptoms, describe how you or extension addressed their needs.

_____

[ProfNeed_4]

Describe what was most difficult for you about balancing personal and professional needs.

_____

[ProfNeed_5]
To what extent do you need professional development in the following areas in preparation for hurricanes?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Working with the media				
Coping with personal stress				
Helping coworkers cope with stress				
Helping clientele cope with stress				
Personal needs (emotional and physical needs)				
Hurricane disaster preparedness				
Hurricane disaster recovery				
Applying my subject matter in disaster situations				
Other				

[ProfNeed_6]
To what extent do you need professional development in the following areas in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.)?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Working with the media				
Coping with personal stress				
Helping coworkers cope with stress				
Helping clientele cope with stress				
Personal needs (emotional and physical needs)				
Hurricane disaster preparedness				
Hurricane disaster recovery				
Applying my subject matter in disaster situations				
Other				

[ProfNeed_7]
How likely would you be to attend or participate in the following training formats in preparation for hurricanes or other emergency situations?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Statewide conference				
District meeting				
Web-based module/CD-ROM				
Telephone conference				
Video conference				
Print materials				
Facebook live				
Social media updates				

[ProfNeed8] How likely would you be to attend or participate in the following training formats in preparation for other emergency situations (sink-hole, tornado, oil spill, etc.)?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Statewide conference				
District meeting				
Web-based module/CD-ROM				
Telephone conference				
Video conference				
Print materials				
Facebook live				
Social media updates				

[ProfNeed9]
Please provide any additional comments regarding professional needs you had during the 2017 hurricane season.

_____

_____

Extension Communication Efforts [CommEffort]

[ComEffort_1]

Please answer the following questions based on your experiences during the 2017 hurricane season. (Select the most appropriate box).

	Not at All	Slight Extent	Moderate Extent	Great Extent
To what extent did you make use of mass media channels to communicate during the recent hurricanes?				
To what extent did your local Extension office make use of mass media channels to communicate during the recent hurricanes?				
To what extent do you believe the general public was aware of Extension's efforts during the recent hurricanes?				
To what extent do you believe your Extension clientele group was aware of Extension's efforts during the recent hurricanes?				

[ComEffort_2]

To what extent did your Extension office use the following communication sources/channels to convey information to the public during the recent hurricane?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Flyers, print materials				
Newspaper				
Radio public service announcements				
Live radio interviews				
TV public service announcements				
Live TV interviews				
Internet/Web				

[ComEffort_3]
Of the communication sources/channels you used, which one was most effective in conveying information to the public during the recent hurricane?

- ○ Flyers, print materials
- ○ Newspaper
- ○ Radio public service announcements
- ○ Live radio interviews
- ○ TV public service announcements
- ○ Live TV interviews
- ○ Internet
- ○ Other _____

[ComEffort_4]
What message(s) were you trying to get across to the public during the recent hurricane? Please describe.

_____

_____

ComEffort_5 To what extent did you make use of the following instruments and personal communication methods to convey information to your extension clientele group during the recent hurricane?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Social media				
Facebook				
Twitter				
Instagram				
The internet				
Face to face				
On-site visits				
The phone				
Text messaging				
Electronic mail (e-mail)				
Other				

[ComEffort_6]
To what extent did your local Extension office make use of the following instruments to communicate to clientele during the recent hurricane?

	Not at All	Slight Extent	Moderate Extent	Great Extent
Social media				
Facebook				
Twitter				
Instagram				
The internet				
Face to face				
On-site visits				
The phone				
Text messaging				
Electronic mail (e-mail)				
Other				

[ComEffort_7] Of the personal communication methods you used, which one was the most effective in conveying information to your Extension clientele group during the recent hurricane?

▼ Facebook ... Electronic mail (e-mail)

[ComEffort_8] What message(s) were you trying to get across to your Extension clientele group during the recent hurricane? Please describe.

_____

[ComEffort_9 Does your Extension office have a plan to manage communication efforts in a crisis like the hurricanes or other emergency situations?

Internally	▼ Yes ... No
Externally	▼ Yes ... No

Technology

Tech_Intro Please answer this next set of questions based on your use of technology during the recent hurricane.

[Tech_Use]
What kind of technology did you personally use during the recent hurricane? (Select all that apply).

[] Smart phone
[] Cell phone (with calling & texting only)
[] Tablet
[] Laptop computer
[] Wireless cellular hotspot
[] Desktop computer
[] Other _____

[Tech_AppUse] Please list any special software or applications (apps) that you used personally during the recent hurricane (e.g. GroupMe; Facebook Messenger; Zello; Voxer, etc).

_____

[Tech_ExtPower] How long were you without power at your Extension office following the hurricane?

_____

[Tech_ResPower] How long were you without power at your residence following the hurricane?

_____

[Tech_CellService] Did you personally lose cellular service?

○ Yes

○ No

[Tech_CellLoss] How long were you personally without cellular service?

_____

Organizational Coordination [OrgCoord]

[OrgCoord_1]
Did you conduct any educational programs related to hurricanes or other emergency situations in 2017?

- ○ Yes
- ○ No

[OrgCoord_2]
What type of educational programs should Extension conduct, in relation to hurricanes or other emergency situations?

- ○ Prior to the emergency situation? _____
- ○ Immediately after the emergency situation? _____

[OrgCoord_3]
To what extent was there a coordinated organizational response from Extension during the 2017 hurricane?

	Not At All	Slight Extent	Moderate Extent	Great Extent
At the county level				
At the district level				
At the state level				

[OrgCoord_4]
To what extent was Extension's response during the 2017 hurricanes effective?

	Don't Know	Not At All	Slight Extent	Moderate Extent	Great Extent
At the county level					
At the district level					
At the state level					

[OrgCoord_5]
Do you have any recommendations for how the Florida Cooperative Extension Service can coordinate efforts during hurricanes and other emergency situations? Please describe in the box below.

_____

[OrgCord_6]
Is Extension a member of your community's emergency response action plan?

- ○ Yes
- ○ No
- ○ I Don't Know

[OrgCoord_6.1]
What is Extension's role as a part of your community's emergency response action plan?

_____

Resources

[Resource_1]
To what extent did you access or contact the following local agencies in order to do your job more effectively before, during, and after the recent hurricanes? (Click the most appropriate box).

	Not at All	Slight Extent	Moderate Extent	Great Extent
County Emergency Management				
County Fire/Rescue				
Local Law Enforcement				
County Road Department				
County &/or City Public Works Department				
County &/or City Solid Waste Department				
County Health Department				
Local/Regional Utilities (electric, gas)				
Telephone Company				

[Resource_2]
To what extent did you access or contact the following state agencies in order to do your job more effectively before, during, and after the recent hurricanes? (Click the most appropriate box).

State

	Not at All	Slight Extent	Moderate Extent	Great Extent
Florida Department of Health				
Florida Department of Transportation				

[Resource_3] **Florida Department of Agriculture and Consumer Services**

	Not at All	Slight Extent	Moderate Extent	Great Extent
Division of Consumer Services				
Division of Animal Industry				
Division of Forestry				
Division of Plant Industry				
Office of Bio & Food Security Preparedness				

[Resource_4] **Florida Department of Community Affairs**

	Not at All	Slight Extent	Moderate Extent	Great Extent
Emergency Management				
Housing and Community Development				

Resource_5 **Florida Department of Environmental Protection**

	Not at All	Slight Extent	Moderate Extent	Great Extent
Water Management District				
Housing and Community Development				

Resource_6 **University of Florida**

	Not at All	Slight Extent	Moderate Extent	Great Extent
UF/IFAS				
Health Science Center				

[Resource_7] To what extent did you access or contact the following federal agencies in order to do your job more effectively before, during, and after the recent hurricanes? (Click on the most appropriate box).

Federal

	Not at All	Slight Extent	Moderate Extent	Great Extent
U.S. Environmental Protection Agency (EPA)				
U.S. Occupational Safety & Health Administration (OSHA)				
U.S. Army Corps of Engineers				

Resource_9

U.S. Department of Agriculture

	Not at All	Slight Extent	Moderate Extent	Great Extent
Farm Service Agency (FSA)				
Natural Resources Conservation Service (NRCS)				
Rural Development (RD)				
Animal & Plant Inspection Services (APHIS)				

Resource_10

U.S Department of Health and Human Services

	Not at All	Slight Extent	Moderate Extent	Great Extent
Federal Emergency Management Agency (FEMA)				

Resource_11

National Oceanic and Atmospheric Association (NOAA)

	Not at All	Slight Extent	Moderate Extent	Great Extent
National Weather Service				
National Hurricane Center				

Extension's Impact During Hurricane Relief
[Impact]

Impact_1 Please describe briefly the impact (success stories) your county Extension office had with clientele during the recent hurricanes.

_____

_____

Impact_2 Please relate briefly how you responded – as an Extension professional – in the hurricane relief efforts in your community.

_____

_____

Impact_3 Please provide the names and contact information (address, phone, email) below of people in your community who you think would be willing to discuss how Extension made a positive impact in your community.

_____

_____

Demographics

Rank What is your Extension rank?

- ○ Extension Agent I
- ○ Extension Agent II
- ○ Extension Agent III
- ○ Extension Agent IV
- ○ Courtesy Extension Agent I
- ○ Courtesy Extension Agent II
- ○ Courtesy Extension Agent III
- ○ Courtesy Extension Agent IV
- ○ Extension Program Assistant
- ○ Other _____

Admin For those with administrative responsibilities only, please check the appropriate box.

▼ County Extension Director ... District Extension Director

Location What county or counties do you work in?

- ○ First _____
- ○ Second _____
- ○ Third _____

Experience How many years of experience do you have with the Cooperative Extension Service?

- ○ In Florida _____
- ○ Outside of Florida _____

Prog_area Please indicate your **primary** program area.

- ○ Agriculture
- ○ Lawn and Garden
- ○ Natural Resources
- ○ Family Resources
- ○ 4 H/Youth Development
- ○ Learning Opportunities
- ○ Other _____

Age What is your age?

▼ 17 and under ... 100

Sex Please indicate your gender.

- ○ Male
- ○ Female

Ethnicity Please indicate the ethnicity with which you most closely identify.

- ○ African-American
- ○ Asian-American
- ○ White, Non-Hispanic
- ○ Hispanic/Latino
- ○ Native American
- ○ Other _____

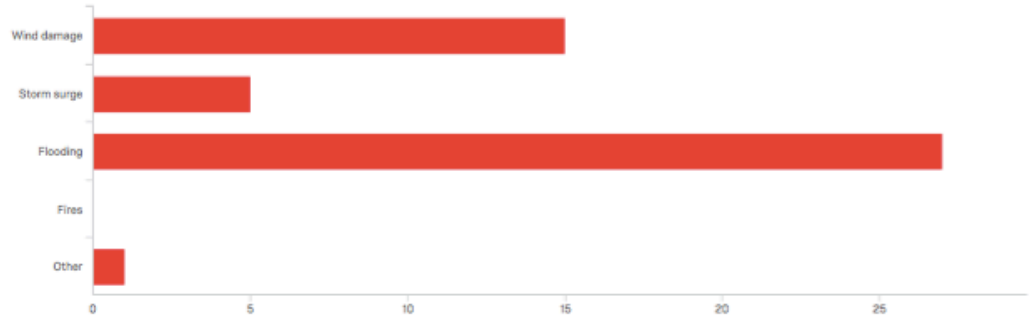
APPENDIX C

Default Report

Rebuild Texas Evaluation

March 26, 2018 8:24 AM CDT

Q3 - What was the main source of damage? Check all that apply.



#	Field		Choice Count
1	Wind damage	31.25%	15
2	Storm surge	10.42%	5
3	Flooding	56.25%	27
4	Fires	0.00%	0
5	Other	2.08%	1
			48

Showing Rows: 1 - 6 Of 6

Other

Other
electric outages

Showing Records: 1 - 1 Of 1

Q4 - What percentage of the county was impacted?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	% of county impacted	0.00	100.00	48.00	32.02	1025.53	34

Q5 - What was the estimated economic impact (in dollars)?

What was the estimated economic impact (in dollars)?
Not sure
$1,000,000
Unknown but minimal
6,000,000
16 billion
Over 500 million
unknown
120.4 million
I dont have access to these numbers
$450,000
60 million
$70.2 million (from FEMA Infographic, 1/26/2018)
less than 10,000
2,500,000,000
$309.5 million according to infographic
$
2 million
200,000

$30,050,000.00
40 Million
150,000,000

20 million
not sure
$500000

Showing Records: 1 - 25 Of 25

Q6 - Provide a brief description of the damage in your county.

Provide a brief description of the damage in your county.
Most of the damage was due to wind mostly to structures like barns. Water damage caused by rain being blown in was most of the damage caused to homes
Home and property flooding along bayou, creeks, rivers. Many of the areas are low income/limited resource.
Flooding to communities.
Numerous roads were damaged due to flooding.
Minimal damage in the county due to Hurricane Harvey.
100 homes were flooded in the south part of the county. There was some damage to fencing in low areas near the Colorado river, and very minimal livestock losses.
flooding, loss of housing, people displaced and not return, loss of some animals, and debris
Excessive rainfall caused the Brazos River to flow out over the flood plain an inundated homes and business. Additionally, structures situated along creeks and Bayous were also flooded when water levels rose above the capacity of the channel and inundated homes, businesses and water wells. Finally, livestock and companion animals had to be shelter.
Extensive flooding to homes and businesses throughout the county. This has lead to road damage and damage to infrastructure as well. We are continually finding new damages that are a result of the flooding.
Flood Damages to most homes
It's estimated that 2,000 homes flooded, yet 5,000 have applied to FEMA for individual assistance. $53.6 million in federal assistance has been paid to flood victims. Agricultural damages were extensive, mostly to 1) Cotton, 2) Beef Cattle, 3) Hay, 4) Soybeans, 5) Rice. Cotton and soybeans across 100% of the county was affected due to heavy rainfall, yet most of the cattle, and hay losses were concentrated on half of the county that was inundated with flood waters from the Colorado and San Bernard Rivers. It's been estimated that we had over at $800,000 in livestock death losses filed with USDA. I don't have direct access to the current ag loss totals.
Precinct 4 roads, some houses with roof damage and localized flooding.
people where flooded in the Evadale community due to the Neches river and the upper part of the county people where flooded due to the Angelina river.
Estimate over 13,000 homes and businesses damaged or affected from massive flooding.
slight wind damage

Severe flooding in low-lying areas, flooding when reservoirs were opened, and the need for more raised roadways to move residents out of harms way.

Electricity was out county-wide for 2 weeks, longer in some areas. We had no water for many days, then it was on for limited hours each day for a couple weeks. At least 80% of buildings had damage, 35% were damaged beyond repair, etc, etc. Most of the damage was from wind, some areas also had storm surge up to 12 ft. All schools were closed until Oct 11. Courthouse was destroyed, City Hall has not reopened..

Almost every property and structure in Aransas County was affected. Most of the damage was caused by wind but a portion of the homes and structures around Copano Bay and Port Bay were damaged by the storm surge.

Mostly wind and flood damage.

Tree limbs/debris removal.

Mostly flooding: damage to roads, houses in low lying areas, & water damage inside structures from wind & rain.

Flood Damage

major damage to fire station in East end of the county (near Refugio County line), roof damage to house, downed trees, windmills downed in cattle pastures

Damage mainly in city of La Grange. The county was impacted with area surrounding La Grange. No school districts were impacted nor did any of the other cities in the county sustained any damage or debris.

36 County buildings damaged. All schools in Victoria ISD Damaged. All schools in Bloomington ISD damaged. Many structures damaged for City of Victoria. Extension office roof blown off.

Many homes and businesses were damaged by the 58" of rain. Schools and businesses were closed for one to three weeks due to roads being flooded and impassable. Crops were destroyed and livestock were lost in flood waters.

flooding of homes, falling trees, loss of hay, damage to livestock, power outages, well contamination, loss of cattle.

Harvey sat over the top of our county at a Category 4 Hurricane for an estimated 10 hours. There was severe wind damage, surges in two cities along the coast, and flooding in different parts of the county. Most had severe damage to their homes making them unlivable. Some are still living in their homes with holes in the ceiling mold etc. Businesses were destroyed and the county was without power for 2 weeks.

Showing Records: 1 - 28 Of 28

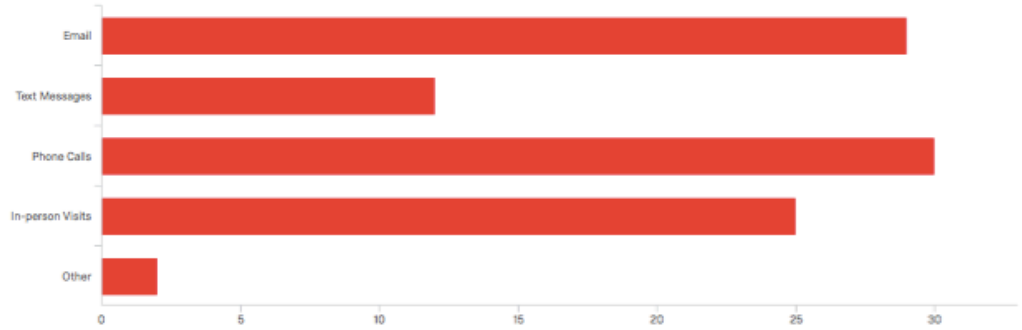
Q7 - Please tell us about the percent of time per week prior Hurricane Harvey you spent...

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Connecting with Commissioners Court	0.00	70.00	16.47	16.32	266.38	30
2	Connecting with Mayors	0.00	70.00	6.88	14.35	205.95	25
3	Connecting with School Officials	0.00	65.00	9.84	13.81	190.61	25
4	Reporting Data	3.00	75.00	18.65	18.33	336.10	31
5	Dealing with issues outside normal content area(s)	0.00	80.00	20.08	24.02	576.84	26

Q8 - Please tell us about the percent of time per week after Hurricane Harvey you spent...

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Connecting with Commissioners Court	0.00	80.00	29.03	21.86	477.96	29
2	Connecting with Mayors	3.00	70.00	20.86	17.00	289.05	28
3	Connecting with School Officials	0.00	75.00	19.90	17.34	300.56	30
4	Reporting Data	6.00	90.00	37.06	24.59	604.64	31
5	Dealing with issues outside normal content area(s)	6.00	100.00	48.56	29.27	856.68	32

Q9 - How do you communicate with elected officials? Check all that apply.



#	Field		Choice Count
1	Email	29.59%	29
2	Text Messages	12.24%	12
3	Phone Calls	30.61%	30
4	In-person Visits	25.51%	25
5	Other	2.04%	2
			98

Showing Rows: 1 - 6 Of 6

Other

Other
Through designated contacts
Thru other non elected officals, Department heads, City Managers, Buisness managers, Assistances

Showing Records: 1 - 2 Of 2

Q10 - What type of information was regularly communicated to you by elected officials?

What type of information was regularly communicated to you by elected offic...
The overall need for inter-agency coordination to prevent or reduce future flooding
No issues to report, only some communities had issues.
Status updates and checking on progress of projects
Road and bridge issues, however most of this damage was leftover from prior floods and fires
needs of their communities, economic impacts, mostly housing needs for displaced people
Elected officials respond to requests for information needed by the Commission or have requested information or help with certain issues.
Questions they may have, informing me of where they are in the process.
Issues of the county due to Hurricane Harvey
Updates and FEMA assistance deadlines. Assessing needs and completing reports requested by the Rebuild Texas Commission. Follow up on information requested of my by elected officials.
EMC updates, county needs for Animal Issues.
we are doing ok, the county/towns are taking care of their people
Any updates or information concerning Rebuild Texas Initiative.
Irregular communication; officials did not communicate needs when contacted.
state of the county and city
Mostly temporary housing needs
Early on, the great need for assistance with debris removal (which has totaled over 3 million cu.yds. to date), need for funding, need to speed up funding.
Elected officials informed us about the problems that the county and the towns were having in regards to recovery. A majority of the problems were and still revolve around the debris removal.

issues

Updates on progress. Our officials were very self motivated to lead recovery efforts.

Typically feed back based on requests for information which we forwarded to them.

unresolved issues post storm and/or progress made in recovery efforts

Bee County did not really have much to communicate due our very limited damage from the Hurricane

Replies to Rebuild Texas reports/surveys. So far, there have been no issues which need to be reported to the commission. City Manager and County Emergency Coordinator have submitted all required surveys and worksheets plus clarified any questions from the commission.

New issues as they were reported or as information flowed to them. The whole situation was fluid in the beginning and changed constantly.

"No New Issues", Still waiting on funds, have not heard back yet, waiting on GLO, Waiting on FEMA, No Contractors available, Do you have anything for me (Money, Funds, Grants)?

situations concerning animals.

Issues in the county. They also updated me on what was happening or had happened so far in their community.

Showing Records: 1 - 28 Of 28

Q11 - On average, how many hours during the week did you or do you anticipate working on Rebuild Texas?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Within the first month of the event	0.00	80.00	32.17	24.05	578.34	30
2	Between October '17 and December '17	2.00	77.00	24.17	20.03	401.01	30
3	Since the first of the year	1.00	53.00	14.03	13.10	171.70	30
4	From present day forward	1.00	45.00	10.90	12.12	146.93	31

Q12 - What were/are some positive aspects of your new role with the Rebuild Texas effort?

What were/are some positive aspects of your new role with the Rebuild Texas...
Positive interaction with community leaders.
I have gotten to meet and talk with officials in cities that I would not normally talk to.
Connecting with officials outside of the normal routine
Strengthened relations with city managers and mayors as well as commissioners court
Learning what the elected officials do and what they have to deal with in the aftermath of the storm. I have a great respect for what the elected officials have to do to keep the cities and the people with the amenities expected (water, lights, food, etc.)
Positive aspects were making new contacts with elected officials not normally contacted during regular job responsibilities.
Better relations with county and city officials.
Partnership with the emergency management
Communication.
Improved communication between all county officials. Now we have a better avenue to request help and address issues.
working with the local officials
Felt like I was assisting with rebuilding effort.
developing contacts, good communication from administration on the process
Positive interaction with elected officials at every level
Feeling like I'm helping people/my community with recovery.
I have been able to build a rapport with elected officials in the community. I have also been able to attend the emergency management and long term recovery meetings so I know what is going on in the recovery process. Also, I am knowledgeable about various resources that I can tell our clientele about.

Recognition for already existing relationships and community reach. This seems to have been slightly overlooked previously but I feel the agency has done a great job recognizing exactly what agents do and their value to the work of the agency.

Recognition was received from City officials.

This gave a new face to my office

It was good to be the liaison for the county in recovery efforts/questions

Have strengthen my working relationship with the Mayor and City Manager. City Manager realized Extension could be a partner or of assistance with the rebuilding process. I have also developed a better working relationship with the county emergency manager.

New, stronger alliances with many local officials and people in the long term recovery groups. Great visibility for Extension as another resource for hurricane response.

Making Connections with Officials might not have had before.

closer relationships with officials.

I built strong relationships with my community and elected officials and we worked together as a team to get things done.

Showing Records: 1 - 26 Of 26

Q13 - What were/are some challenges of your new role with the Rebuild Texas effort?

What were/are some challenges of your new role with the Rebuild Texas effor...
Connecting with the right person that had the answers tot he current issues.
Some cities had nothing affected so it was hard to get in contact with them. Fitting it into my normal busy work schedule
Our role was conflicting with other local officials roles and at times our mission and purpose was unclear and appeared redundant at best
Working in an area unfamiliar to me, learning new terminology
Identifying who the contact people are, and how to contact them, and then getting them to realize we were here to help. Also, it seemed early on that we were part of the problem not part of the solution with as much devastation as we had.
1. .Not receiving a response in a timely manner when information was requested. 2. Twenty-four to 36 hour turn around for information requests by the Commission.
Adapting to new role, understanding what was needed and how best to assist.
1. Reporting everyday 2. Tracking Down County Official to answer question that were needed 3. Being the only agent and having to deal with office issues and rebuild Texas
Officials didn't identify nor value our role in the Rebuild Texas effort in my County. Having Extension Agents in such a role was unexpected and new to our officials. Our officials valued our role in animal response and recovery and well as water quality testing both prior to and during the storm. They expect that of us and look to us in those roles. Getting them to identify us in the Rebuild Texas role was a challenge.
Our county was not heavily impacted so the frequency of contacting officials seemed to be burdensome according to feedback from some of the officials. They simply did not have enough damage or need for the protocol but did see the benefit for the other more heavily damaged counties.
getting some of the local officials to know my role was during this time period
Keeping up with assigned job duties.
time management, over loaded/whelmed, this is a new area for extension which we are not qualified or have expertise
Understanding FEMA's role and that of other agencies
Too much to do, especially when our building had no electricity and water, secretary hadn't returned due to damage to her house. Being required to provide information to our officials that they already had Knowing they will call John Sharp or John Barton before calling me with an issue. They go straight to the source.

I have had hardly any emergency management training, so I didn't know what everything meant so I didn't always feel comfortable being reporting back when I wasn't 100% certain on the subject. At first, it was also hard trying to recover on a personal level and dealing with helping others recover was a little overwhelming.

We sustained very minimal damage so at times the reporting "nothing new to report" seemed excessive and demanding. I recognize the importance of uniformity across all affected areas though. The only other challenge would be managing time appropriately the few times there was attention needed for Rebuild Texas and needing to set aside other professional obligations.

Navigation of paperwork processes which we have no experience or knowledge of. Maintaining preplanned events on top of all the unplanned Rebuild efforts. Coordination of efforts without antagonizing EM officials who were already doing much of what we were being asked to do. Interpretation of new and developing agency expectations of priority effort to traditional clientele who did not understand why our time and effort was being redirected.

duplication of information that had previously been sent by our county EMC

Since my county did not have much damage/recovery efforts it would have been nice to have "fringe" counties be released from reporting sooner since most of my reports were "nothing new to report" since Bee County was up and running like normal within a short period of time post hurricane.

May of the reports were duplicates of reports already submitted by these entities. This caused conflicts in the beginning with the county emergency manager.

Explaining WHAT our role really was in the effort to so many different groups. Carving out the time from regular work. Trying to learn and understand exactly how/what we were supposed to be doing to assist the rebuilding effort.

Being Borderline pushy might have lost some of the new connections made.

reporring

Time management was an issue. I was hard to get back to my "normal" job because there was so much that needed to be done through Rebuild Texas because my county was hit so hard.

Showing Records: 1 - 26 Of 26

Q14 - How would you improve the Rebuild Texas process used in this effort?

How would you improve the Rebuild Texas process used in this effort?
Pre- event training
Not to sure, somehow take something off my plate so I can connect with officials better so gaining information from them won't be so hard in future events.
Defined role communicated to local officials before we as agents are asked to make contacts, gather information, and share information.
Not require frequency of reporting for less affected counties
To realize that the people in the trenches can't respond to meetings and information needs as quickly as we were asking for the information. Also, we need to start now with basic information being collected in the counties to be prepared for a disaster, not wait till one hits: names, addresses, emails, meet with the people in the offices to let them know what the Commission is and how it plays into the scheme of things on their side so that we are a component of the prep not an irritant after the fact while the elected officials are trying to get things back up and running.
For fringe counties that were not in thee eye of the storm customized reporting, One size fits all does not work in all instances.i. Reduce the number of "mandatory" fields in survey 123, e.g. cellphone numbers. A clear and concise directive communicated to all elected officials, TAMUS employees, etc..of the role being played by Agrilife employees. It took a long time for locals, some are still struggling, to grasp the liaisons role.
More training.
Duplicate of information that has already been issued. A lot of the time when I was in contact with official they said they already received the information.
Plan our involvement well in advance of the disaster. Some say "have a plan and work the plan". We had our local plans and we knew our role in those plans before, during and after the storm. We worked those local animal issues and water quality response plans. Rebuild Texas was not in the plan until just five days into recovery.
None
have a training/webinar with agents and local officials so we all know what each of our roles are before, during and after a disaster
Bi-weekly reporting with limited number of contacts (5) is manageable
give and take, if you are giving us additional responsibilities administrators must be compassionate about our duties especially in balancing work and family life.
Training on the role of all the key players involved in disaster preparation, recovery, mitigation ....
Some training from agents who'd been thru something similar about all the minutiae to expect in order to be better prepared. IDK what else. The first reporting app we used gave us no feedback which was a problem, but that has improved a lot.

I think we definitely should have had trainings!!!

I am not sure I am equipped with enough experience to answer this given the little damage sustained and minor recovery in my county. I do appreciate the regular contact with the Rebuild Texas administration and clear communication of expectations!

Formal training for all employees would be a great start.

Maybe just make sure that all parties involved in emergency management are on the same page with what is being sent out and when by whom

I think it is a great process and initiative for those counties with major on going damage.

Ability to personalize the reports in regards to the level of damage sustained by our county. We could have eliminated any reference to any of our school districts after the 1st report, etc.

Produce a short video to be sent to all organizations detailing who Extension is and how we fit into the Rebuild Texas effort.

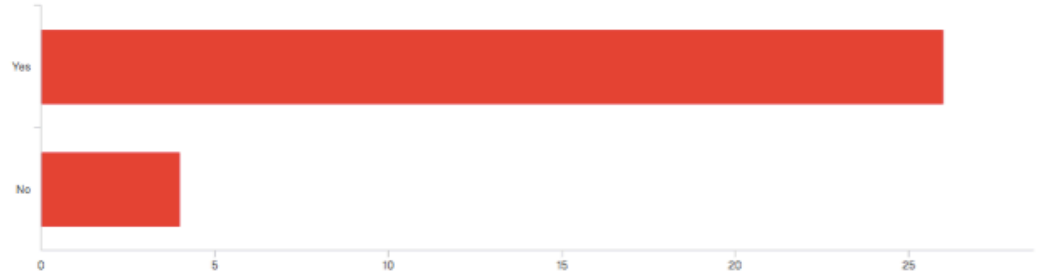
Make contacts with local officials. Give them opportunity to work with us and after a couple months leave it on them to contact you with new issues (these people have other responsibilities too). Give elected official authority to let liaison contact assistance that might actually know more than elected official in smaller towns (City Manager, Business manager, Emergency Manager, ect.). When information is asked for some instances need more time to gather a response. When you have a weeks worth of programs scheduled and you get a text or email requesting information and need it in two days it is hard to get that information when some of these officials are hard to get in touch with.

every disaster is different. not sure i would change anything.

I think it was beneficial, people just expected things to go faster which I understand cant happen.

Showing Records: 1 - 26 Of 26

Q15 - Does this new role allow you to connect with people you had not worked with before?



#	Field		Choice Count
1	Yes	86.67%	26
2	No	13.33%	4
			30

Showing Rows: 1 - 3 Of 3

Q16 - Please express why you have or have not connected with people you had not worked with before.

Please express why you have or have not connected with people you had not w...
Out of scope of programming
I have not needed to connect with city managers for FCH and 4-H programs.
I had some connections with mayors and city managers from some programs, but not to the extent we have had contact now.
There was no need to connect with some of them with what I do, also there are others that I work with that can get me where I need to be with my job. This was a different scope of things at a different level.
As an Extension Educator there was no need to interface with a Mayor, City Manager, or Superintendent. The interaction was either with a subordinate or there was no reason other then a chance meeting at an event.
I have been able to connect with people that have information or have resources that have been valuable to me.
I've work with the people before but now we have greater understanding of each other jobs
Because dealing with City Mayors regarding city debris and public assistance applications has never been our role as Extension Agents.
I have worked with our 2 Mayors prior to the hurricane on various projects and have also worked with both school superintendents on educational programs for youth since coming to the county. I had already been working and communicating with the Judge and commissioner's court for normal job related issues as well as the EMC.
have always connected with judge and commissioner, city mayors where the new people I worked with
No comment
We've never been involved in this level of disaster recovery bezforemnego.
Exposure to them in Emergency Management (now Long Term Recovery) meetings which began as twice daily 7 days a week, now once a week. Exposure to TDEM, different TFS people. Different situations mean connecting with different people.
I have connected with many people I had not worked with before because I attend the long term recovery meetings.
In most cases, the school district for example, there are other contacts within the district that are our direct point for programming. We typically coordinate with principals or teachers for programming, not the superintendent.

Individuals whom I had not connected with previously were not traditional contacts for our programming areas.

I don't regularly see every school superintendent or Mayor

Before the hurricane, there was little need for me to connect with FEMA, TDEM, and many of the long term RECOVERY groups in the county.

Some of these people do have not fit into programing efforts before.

mostly volunteers that arent in our program wanted to help.

I was still relatively new to the county.

Showing Records: 1 - 21 Of 21

Q17 - Please explain what tasks (e.g., family, job, personal, etc.) you are not able to fulfill since taking on Rebuild Texas duties.

Please explain what tasks (e.g., family, job, personal, etc.) you are not a...
none
I was personally flooded, we had the animal shelter to help with, I had to cancel programs due to the flood, shelter and move things around to take care of Rebuild. I also got married in November but John took over my contacts so I could take off for 2 weeks and not worry about Rebuild.
Just one more thing on the to do list and nothing seems to ever come off.
Time constraints with Rebuild Texas have made it more difficult to carry out planned educational programs.
It has been difficult to keep up with everything, but I have managed to do so. Some things had to be put on the back burner or just let go to make everything work.
I had a few working vacations, either staying in town or working while on vacation to work on Rebuild Texas. I put off family plans. I struggled with balance between Rebuild Texas duties and my regular duties and responsibilities. It has improved with time, but initially it caused a lot of stress professionally and personaly
Some programming has been pushed back and not being implemented as anticipated due to conflicts with Rebuild Texas responsibilities.
N/A
I've had difficulty planning and conducting my planned educational programs. Since August I've been late on almost every deadline. I've had to plan program agendas at the last minute. I just can't seem to get caught up. I haven't dropped a single program, or rescheduled a previously planned event due to the extra work load, but it's been exhausting. I've lost a lot of evenings and weekends spent with my family due to my duties with Rebuild Texas. I've had to work late many evenings just to get caught up on my normal work duties while during the day I had to complete tasks with Rebuild Texas. From September 5 through December 12 our Extension Office was dedicated 8 hours a day to handling inquiries on well water safety and conducting well water tests. We had 606 county residents pass through our office doors seeking information on well water quality and testing, and in all cases we interacted with each of these individuals on 3 occasions. That's 1,818 individual contacts, or 29 office contacts each work day from September to early December, all dealing with well water quality and testing. We tended to our normal job responsibilities, but these added tasks came first and our normal jobs came second.
None
have not had any problem doing my roles with rebuild texas and other job duties that needed to be done
Assigned work related tasks: had to prioritize average work assignments to meet deadlines requested by Rebuild Texas effort. Personal: not too stressful as the Rebuild Texas program action items decreased in number over time.
other day to day responsibilities, having to continue reporting and contacting evening hours and weekend

None, but more difficult to finish any task on time.

For the first month or 6 weeks, hardly being able to have a personal life without intrusions, and not having enough time to take care of personal recovery issues--insurance, contractors, etc. I've had a hard time finding time for all the other required reports.

I am able to fulfill all tasks now as it has slowed down and I am not the liaison.

Personal time and personal responsibilities at home

We were not impacted enough for the Rebuild Texas duties to have that much of an impact on other tasks. There were a few days I struggled to manage time so that all responsibilities could be addressed by generally speaking this does not apply to me.

New unplanned educational programming did not occur through the end of the year. Some family events were not attended or held due to Rebuild efforts. Personal time was very limited to non-existent early on.

This just added another layer to everything that I am doing that already takes away from my personal/ family life

Did not interfere with any of my other tasks. I was able to quickly work out the daily reports with the City Manager. He and the Mayor were easy to access for necessary information so I was not delayed on reporting.

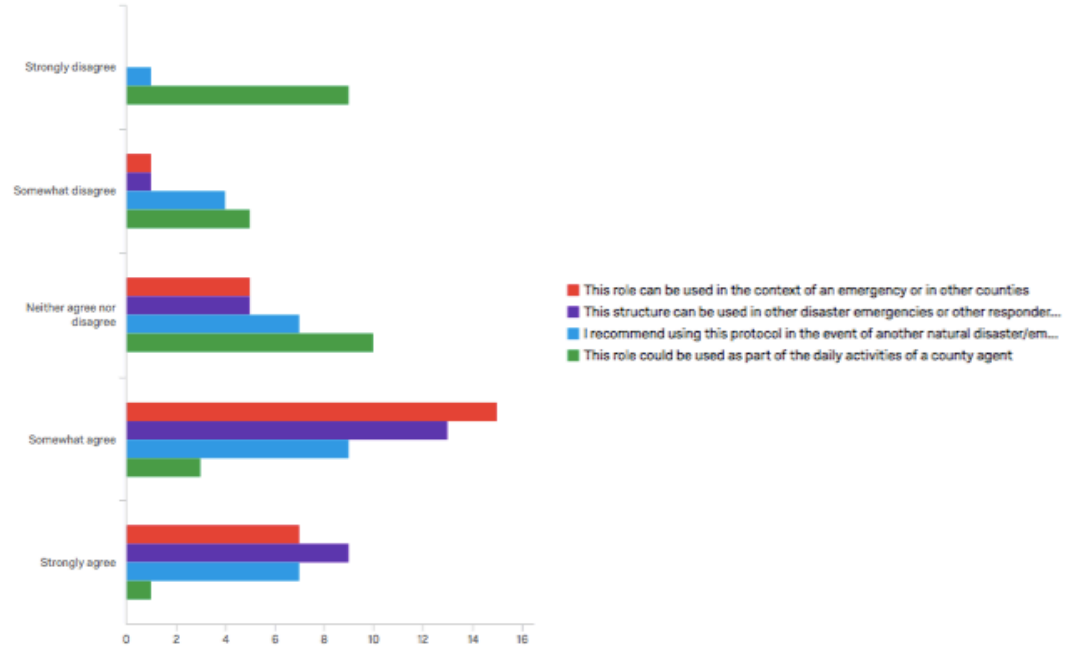
In the very beginning as information was coming in quite quickly, I was unable to do many family things. After I got a grasp on the volume, I was better able to manage my time.

luckily I have a co-worker and we didn't sacrifice much. just time and some program cancellations.

Sometimes work duties have to be put on hold for Rebuild Texas things but I think I've handled it pretty well.

Showing Records: 1 - 24 Of 24

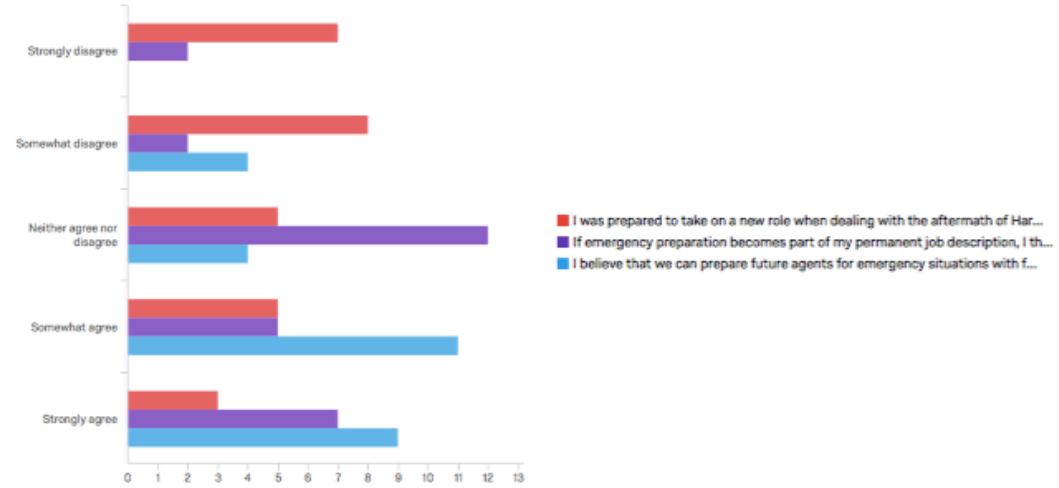
Q18 - Please rate your level of agreement with the following statements



#	Field	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Total
1	This role can be used in the context of an emergency or in other counties	0.00% 0	3.57% 1	17.86% 5	53.57% 15	25.00% 7	28
2	This structure can be used in other disaster emergencies or other responders	0.00% 0	3.57% 1	17.86% 5	46.43% 13	32.14% 9	28
3	I recommend using this protocol in the event of another natural disaster/emergency	3.57% 1	14.29% 4	25.00% 7	32.14% 9	25.00% 7	28
4	This role could be used as part of the daily activities of a county agent	32.14% 9	17.86% 5	35.71% 10	10.71% 3	3.57% 1	28

Showing Rows: 1 - 4 Of 4

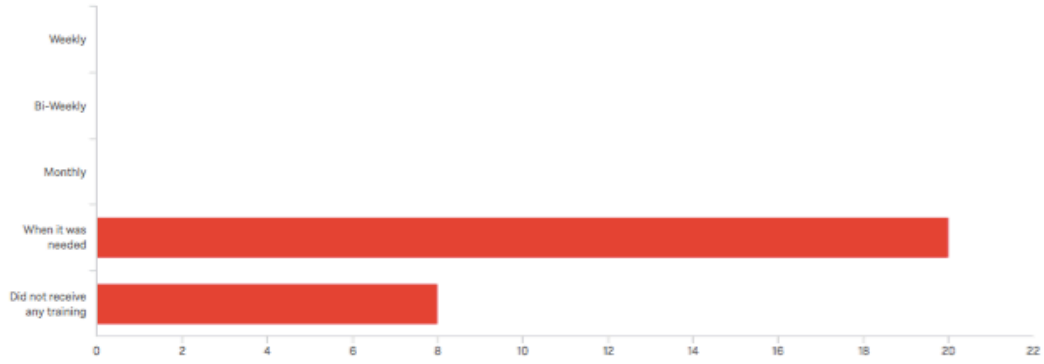
Q19 - Please rate your level of agreement with the following statements



#	Field	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Total
1	I was prepared to take on a new role when dealing with the aftermath of Harvey	25.00% 7	28.57% 8	17.86% 5	17.86% 5	10.71% 3	28
2	If emergency preparation becomes part of my permanent job description, I think that there is a need to add additional agents to my county specifically for emergency preparation	7.14% 2	7.14% 2	42.86% 12	17.86% 5	25.00% 7	28
3	I believe that we can prepare future agents for emergency situations with formal training at the university level	0.00% 0	14.29% 4	14.29% 4	39.29% 11	32.14% 9	28

Showing Rows: 1 - 3 Of 3

Q20 - How often did you receive training for Rebuild Texas?



#	Field		Choice Count
1	Weekly	0.00%	0
2	Bi-Weekly	0.00%	0
3	Monthly	0.00%	0
4	When it was needed	71.43%	20
5	Did not receive any training	28.57%	8
			28

Showing Rows: 1 - 6 Of 6

Q21 - Please tell us about the positive aspects of the training.

Please tell us about the positive aspects of the training.
timely and accurate accessible when I had time to dedicate to it
Training happened when we needed it.
Did not receive any training
Online training was helpful so we didn't have to travel
I am not sure we were really trained. We had a couple of webinars on using the reporting software and that was it. I did not feel adequately trained.
The training received to use Survey 123 was valuable.I can't think of any other training received for Rebuild Texas.
helped in being more prepared and helped to answer questions that arose within the county.
Allowed me to properly use the Survey App.
No comment.
I think everyone was learning from administration to the boots on the ground.
Extension did attempt.more in-depth training is needed well in advance of emergencies
We had some phone conferences and training on the app but no real Rebuild Texas training
We only had trainings, from what I can recall, over the app. These trainings were helpful.
I got what I needed when I needed it
Gave us the overview of the program and expectations for reporting. Also, information about some of the funding aspects.
The situation was so fluid, it was really impossible for the leadership to be able to get out in front of training needs. They were provided as needed.
I got nothing to add here.
got the job done.

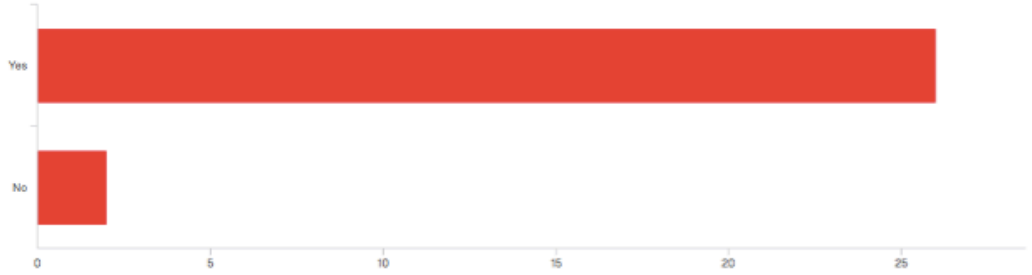
Showing Records: 1 - 18 Of 18

Q22 - Please tell us about the aspects of the training that need improvement.

Please tell us about the aspects of the training that need improvement.
no suggestions
Not sure.
All of it
None
I am not sure we were really trained. We had a couple of webinars on using the reporting software and that was it. I did not feel adequately trained. I would say that we need to take a look at the whole process, regroup, identify what the Rebuild Texas Commission is all about and go from there with a training program, but don't wait till there is another emergency.
More training done in advance in order to be prepared and be able to respond with confidence.
Not enough training prior to engaging agents in their role with Rebuild Texas. We had one webinar that trained us on our role with Rebuild Texas and we had one webinar that trained us on using the Survey 123 app.
We need more training on dealing with conflict and or frustrated officials.
Training was minimal; but then again, my role was not as management so minimal training provided was appropriate to my role.
had no formal training. we are dealing with someone's livelihood
All!
We should have received trainings over what everything is, in regards to emergency management.
I just think after being through it, it would have been good to have a better emergency management understanding going in to be able to keep up with converstaion
Be more specific and detailed. Make sure we actually know what and when to do things.
We received some training early on via web ex. This was a very hectic time when response was still very active. What little training we had via web ex there were 100 things going on at the same time. These are some things that can be done before an event with agents and would make the next response better.
before an event.

Showing Records: 1 - 16 Of 16

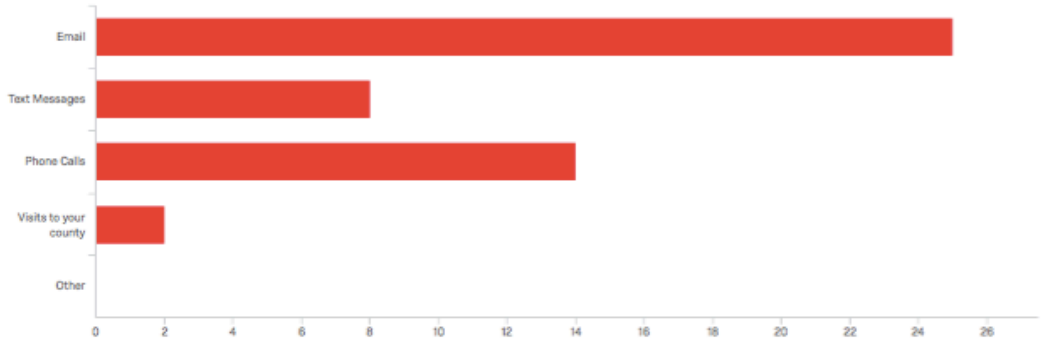
Q23 - Do you receive regular communication from Extension Leadership about your Rebuild Texas work?



#	Field		Choice Count
1	Yes	92.86%	26
2	No	7.14%	2
			28

Showing Rows: 1 - 3 Of 3

Q24 - What ways do you receive this communication? Check all that apply.



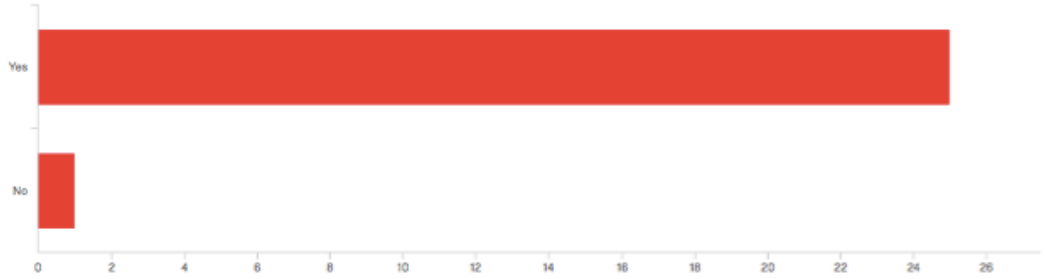
#	Field		Choice Count
1	Email	51.02%	25
2	Text Messages	16.33%	8
3	Phone Calls	28.57%	14
4	Visits to your county	4.08%	2
5	Other	0.00%	0
			49

Showing Rows: 1 - 6 Of 6

Other

Other

Q25 - Has the communication been effective in this role?



#	Field		Choice Count
1	Yes	96.15%	25
2	No	3.85%	1
			26

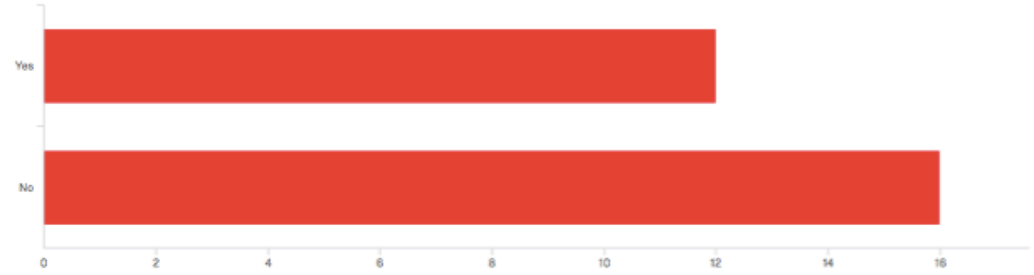
Showing Rows: 1 - 3 Of 3

Q26 - Tell us why or why not

Tell us why or why not
Response and follow up was excellent
Timing is a problem things come to us without a real direction of what the expectations are and they seem to be needed immediately. Meetings are called the same way. Also, I felt confused sometimes of what should go to the elected officials and what was being sent by someone else. there were times you felt like the right hand didn't know what the left hand was doing.
It is important to know what is expected and needed.
It has helped to understand the scope of our role in Rebuild Texas.
What I did not like is not being informed of meetings or hearings that were being held in my area. In one case I learned of a local hearing with the State Senate Ag and Rural Affairs Committee from a farmer, not through Rebuild Texas. In different cases we were informed of regional Rebuild Texas meetings, but told that it was not required that we attend. We were asked to share details with officials on these meetings, but in most cases our officials already knew about the meeting. I didn't know how to take it when so much was expected of us as liaisons with Rebuild Texas, but then we were not required to attend a Rebuild Texas regional meeting.
Daily, then weekly communication was directed, focused and meaningful.
better than before in regards to adopting a new program or responsibility
Timely, but often lacks details needed to answer questions
Mostly effective. A lot of it is general info. for everyone. The phone calls on specific issues have been most effective.
It has been effective because I know what my role is in regards to Rebuild Texas.
We have learned what we needed to know; although, we often didn't and don't know why we needed to be included within some of the effort.
Information could be passed on to officials as needed to keep them updated.
It was effective.
When something is needed it is normally done ok. Sometimes the timing is a little short notice but it seems like that is coming from Governors office and needed right away. Sometimes it is hard at a local level to get information from elected officials that quick.
always able to communicate with someone.
I think it is effective because if I have questions, someone is always there to answer quickly. They also let you know when you were doing a good job and I appreciated that.

Showing Records: 1 - 16 Of 16

Q27 - Do you receive communication from community members about your Rebuild Texas work?



#	Field		Choice Count
1	Yes	42.86%	12
2	No	57.14%	16
			28

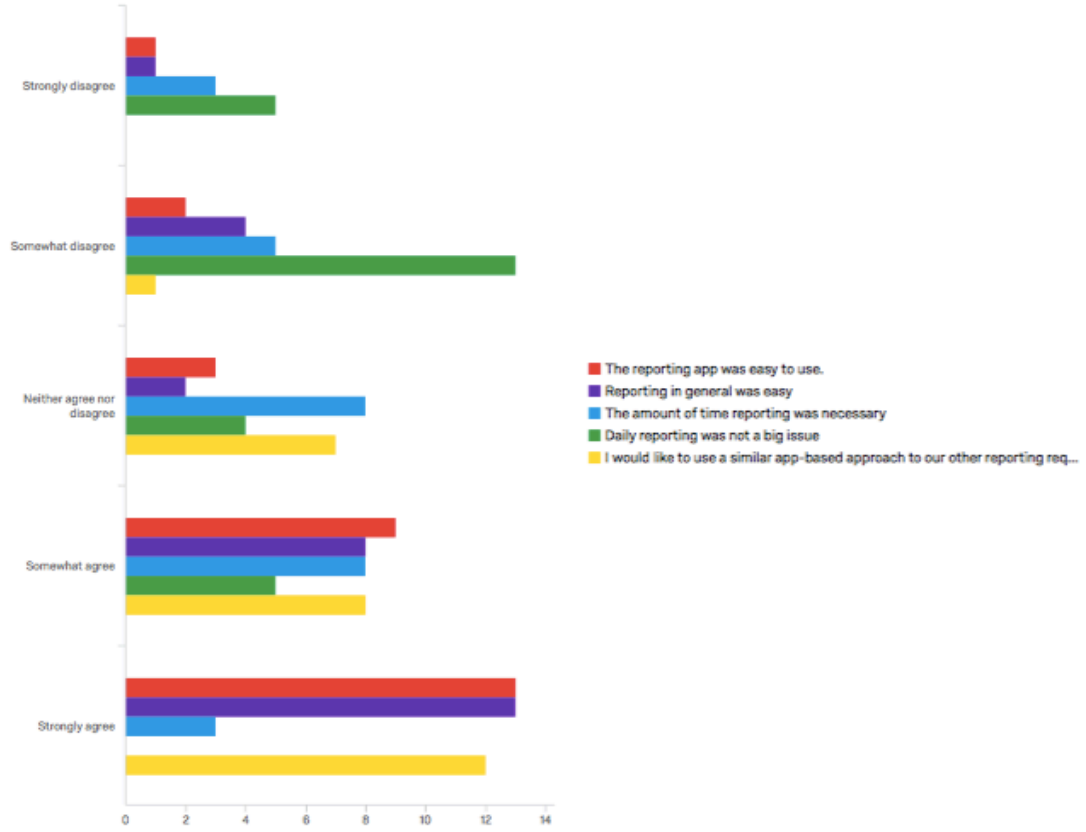
Showing Rows: 1 - 3 Of 3

Q28 - What types of information was communicated to you?

What types of information was communicated to you?
Infrastructure needs and and questions about what assistance programs were offered
Email groups of what is going on in my county usually from the county office through county emergency management.
Well water and Debris removal
When I reached out through my own communication channels that I use as an agent on a daily basis regarding Houses of Worship being eligible for public assistance. I then received requests for more information and details from pastors of local churches. I received requests from banks who had customers who were churches who needed more information on public assistance. Basically they communicated their need for more information, assistance with applications, and their appreciation for reaching out to them. I did this because I had a feeling that our local officials weren't communicating Public Assistance for Houses of Worship after I had sent the details to our officials. I reached a lot of churches through my communication.
The level of what we can provide to those in need.
What items were needed to send up to Rebuild Texas.
Questions about the process and status updates.
We received answers to questions we were asking. On some occasions we did receive requests for assistance or additional information detail.
In the beginning it was a question about why I am doing this when we already have a county EMC. Then the flow changed to assistance with unresolved issue assistance through me
If there is a need for clarification or, in one case, getting added to an online conference call. Also, received thanks for receiving donated equipment.
Email, in person, and telephone information.
damages, volunteer envolment and planning.

Showing Records: 1 - 12 Of 12

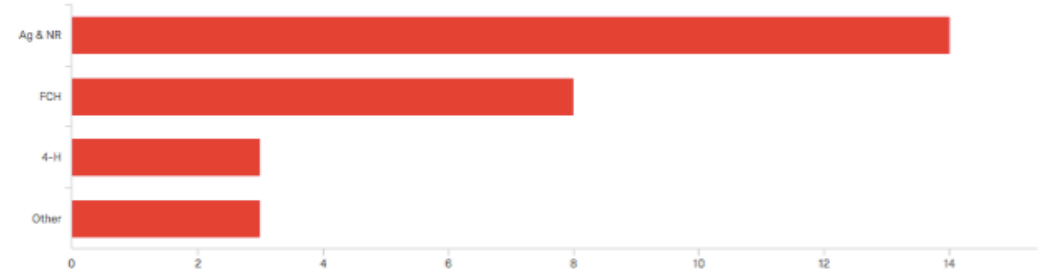
Q29 - Please rate your agreement with the following statements.



#	Field	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Total
1	The reporting app was easy to use.	3.57% 1	7.14% 2	10.71% 3	32.14% 9	46.43% 13	28
2	Reporting in general was easy	3.57% 1	14.29% 4	7.14% 2	28.57% 8	46.43% 13	28
3	The amount of time reporting was necessary	11.11% 3	18.52% 5	29.63% 8	29.63% 8	11.11% 3	27
4	Daily reporting was not a big issue	18.52% 5	48.15% 13	14.81% 4	18.52% 5	0.00% 0	27
5	I would like to use a similar app-based approach to our other reporting requirements	0.00% 0	3.57% 1	25.00% 7	28.57% 8	42.86% 12	28

Showing Rows: 1 - 5 Of 5

Q30 - What is your primary subject area?



#	Field		Choice Count
1	Ag & NR	50.00%	14
2	FCH	28.57%	8
3	4-H	10.71%	3
4	Other	10.71%	3
			28

Showing Rows: 1 - 5 Of 5

Other

Other
Coastal and Marine
Mid mgr.
I do all Ag/NR and 4H

Showing Records: 1 - 3 Of 3

Q31 - How long have you been with Extension?

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	Years of Service (round up to nearest year)	1.00	31.00	13.29	8.84	78.13	28

End of Report

Texas Fire Survey

Start of Block: Default Question Block

The Department of Agricultural Leadership, Education, and Communications at Texas A&M University is conducting research on the response to natural disasters. We are currently collecting data to assess natural disasters through the lens of extension professionals in Texas, Florida, and California. We are reaching out to you in the hopes that you will provide us your input on this important topic. The aim of this study is to gain a better understanding of Texas A&M AgriLife Extension's involvement and impact before, during, and after wildfires in 2017 and 2018. Your responses will provide valuable information that will help guide Extension's future role in preparedness and relief efforts, as well as identify Extension faculty's professional needs.

Page Break

Q2 What district do you represent?

- ○ District 1 (5)
- ○ District 2 (6)
- ○ District 3 (9)
- ○ District 5 (10)
- ○ District 6 (7)
- ○ District 7 (11)
- ○ District 10 (13)
- ○ District 11 (14)
- ○ District 12 (15)
- ○ Other (8) _____

Q4 What was the estimated economic impact in your county in dollars?

_____

_____

_____

_____

_____

Q5 Provide a brief description of the damage in your county

_____

_____

Q6 Please tell us about how many hours per week prior to wildfires in your county you spent...

	0	5	10	15	20	25	30	35	40	45	50
Connecting with Commissioners Court ()											
Connecting with Mayors ()											
Connecting with School Officials ()											
Reporting Data ()											
Dealing with issues outside normal content area(s) ()											

Q7 Please tell us about how many hours per week after wildfires in your county you spent...

	0	5	10	15	20	25	30	35	40	45	50
Connecting with Commissioners Court ()											
Connecting with Mayors ()											
Connecting with School Officials ()											
Reporting Data ()											
Dealing with issues outside normal content area(s) ()											

Q8 How do you communicate with elected officials? Check all that apply.

- [ ] Email (1)
- [ ] Text Messages (2)
- [ ] Phone Calls (3)
- [ ] In-person Visits (4)
- [ ] Other (5)

Display This Question:

If How do you communicate with elected officials? Check all that apply. = Other

Q9 If you selected Other please explain.

_____

_____

_____

_____

_____

Q10 What type of information was regularly communicated to you by elected officials?

_____

_____

_____

_____

_____

Q11 On average, how many hours during the week did you or do you anticipate working on mitigating damage from wildfires?

	0	8	16	24	32	40	48	56	64	72	80
Within the first month of the event ()											
Since the first of the year ()											
From present day forward ()											

Q12 What were/are some positive aspects of your role within your county after the wildfire(s)?

_____

_____

_____

_____

_____

Q13 What were/are some challenges of your role within your county after the wildfire(s)?

_____

_____

_____

_____

_____

Q14 How would you recommend to improve these challenges?

_____

Q15 What message(s) were you trying to get across to the public during the recent fires? Please describe.

_____

_____

_____

_____

_____

Q16 Have you been able to connect with people you had not worked with before, during, or after the wildfire(s)?

- Yes (1)
- No (2)

Q17 Please express why you have or have not connected with people you had not worked with before.

_____

_____

_____

_____

_____

Q18 Please explain what tasks (e.g., family, job, personal, etc.) you are not able to fulfill since taking on duties from wildfire(s) affecting your county.

_____

_____

_____

_____

_____

Q19 Please rate your level of agreement with the following statements

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This role can be used in the context of an emergency or in other counties (1)	○	○	○	○	○
This structure can be used in other disaster emergencies or other responders (2)	○	○	○	○	○
I recommend using this protocol in the event of another natural disaster/emergency (3)	○	○	○	○	○
This role could be used as part of the daily activities of a county agent (4)	○	○	○	○	○

Q20 Please rate your level of agreement with the following statements

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I was prepared to take on a new role when dealing with the aftermath of the wildfire season (1)	○	○	○	○	○
If emergency preparation becomes part of my permanent job description, I think that there is a need to add additional agents to my county specifically for emergency preparation (2)	○	○	○	○	○
I believe that we can prepare agents for emergency situations from formal training at the university level (3)	○	○	○	○	○

Q21 What do you think are some ways that Extension Agents can work within the community to prevent wildfires?

_____

_____

_____

_____

_____

Q22 Is there any plan or enacted legislation that aims to reduce the impact of wildfires?

- Yes (6)
- No (7)

Display This Question:

If Is there any plan or enacted legislation that aims to reduce the impact of wildfires? = Yes

Q23 If yes was selected please explain.

_____

_____

_____

_____

_____

Q24 How often did you receive training for natural disasters?

- ○ Weekly (1)
- ○ Bi-Weekly (2)
- ○ Monthly (3)
- ○ When it was needed (4)
- ○ Did not receive any training (5)

Skip To: Q30 If How often did you receive training for natural disasters? = Did not receive any training

Q25 What type of natural disaster training did you receive (e.g., wildfire, flooding, wind damage, earthquake)

_____

Q26 Please tell us about the positive aspect of the training.

_____

_____

_____

_____

_____

Q27 Please tell us about the aspects of the training that need improvement.

_____

_____

Q28 To what extent do you need professional development in the following areas in preparation for wildfires?

	Not at all (1)	Slight Extent (2)	Moderate Extent (3)	Great Extent (4)
Working with the media (1)	○	○	○	○
Coping with personal stress (2)	○	○	○	○
Helping coworkers cope with stress (3)	○	○	○	○
Helping clientele cope with stress (4)	○	○	○	○
Personal needs (emotional and physical needs) (5)	○	○	○	○
Wildfire disaster preparedness (6)	○	○	○	○
Wildfire disaster recovery (7)	○	○	○	○
Applying my subject matter in disaster situations (8)	○	○	○	○

Q29 How likely would you be able to attend or participate in the following training formats in preparation for hurricanes or other emergency situations?

	Not at all (1)	Slight Extent (2)	Moderate Extent (3)	Great Extent (4)
Statewide conference (1)	○	○	○	○
District meeting (2)	○	○	○	○
Web-based module (3)	○	○	○	○
Telephone conference (4)	○	○	○	○
Video conference (5)	○	○	○	○
Print materials (6)	○	○	○	○
Facebook live (7)	○	○	○	○
Social media updates (8)	○	○	○	○

Q30 Do you receive regular communication from Extension Leadership about your work after the wildfire season?

- ○ Yes (1)
- ○ No (2)

Q31 What ways do you receive this communication? Check all that apply.

- [ ] Email (1)
- [ ] Text Messages (2)
- [ ] Phone Calls (3)
- [ ] Visits to your county (4)
- [ ] Other (5)

Q32 Has the communication been effective in this role?

- ○ Yes (1)
- ○ No (2)

Q33 Tell us why or why not.

_____

_____

_____

_____

_____

Q34 Do you receive communication from community members about recovery work from the recent wildfire(s)?

- ○ Yes (1)
- ○ No (2)

Q35 What types of information was communicated to you?

_____

_____

_____

_____

_____

Q36 To what extent did you access or contact the following local agencies in order to do your job more efficiently before, during, and after the recent wildfires? (Click the most appropriate box).

	Not at All (1)	Slight Extent (2)	Moderate Extent (4)	Great Extent (5)
County Emergency Management (1)	○	○	○	○
County Fire/Rescue (2)	○	○	○	○
Local Law Enforcement (3)	○	○	○	○
County Road Department (4)	○	○	○	○
County &/ or City Public Works Department (5)	○	○	○	○
County &/ or City Solid Waste Department (6)	○	○	○	○
County Health Department (7)	○	○	○	○
Local/Regional Utilities (electric, gas) (8)	○	○	○	○
Telephone Company (9)	○	○	○	○
Other (10)	○	○	○	○

Skip To: Q37 If To what extent did you access or contact the following local agencies in order to do your job mor... = County Fire/Rescue

Skip To: Q37 If To what extent did you access or contact the following local agencies in order to do your job mor... = County Road Department

Skip To: Q37 If To what extent did you access or contact the following local agencies in order to do your job mor... = County &/ or City Public Works Department

Q37 If you selected other please describe which local agencies you contacted.

_____

_____

_____

_____

_____

Q38 Do you have any recommendations for how we can coordinate efforts during wildfires and other emergency situations? Please describe in the box below.

_____

_____

_____

_____

_____

Q39 What is your primary subject area?

- Ag & NR (1)
- Family & Community Sciences (2)
- 4-H (3)
- Other (4)

Skip To: Q40 If What is your primary subject area? = Other

Q40 If you selected other, please state your primary subject area.

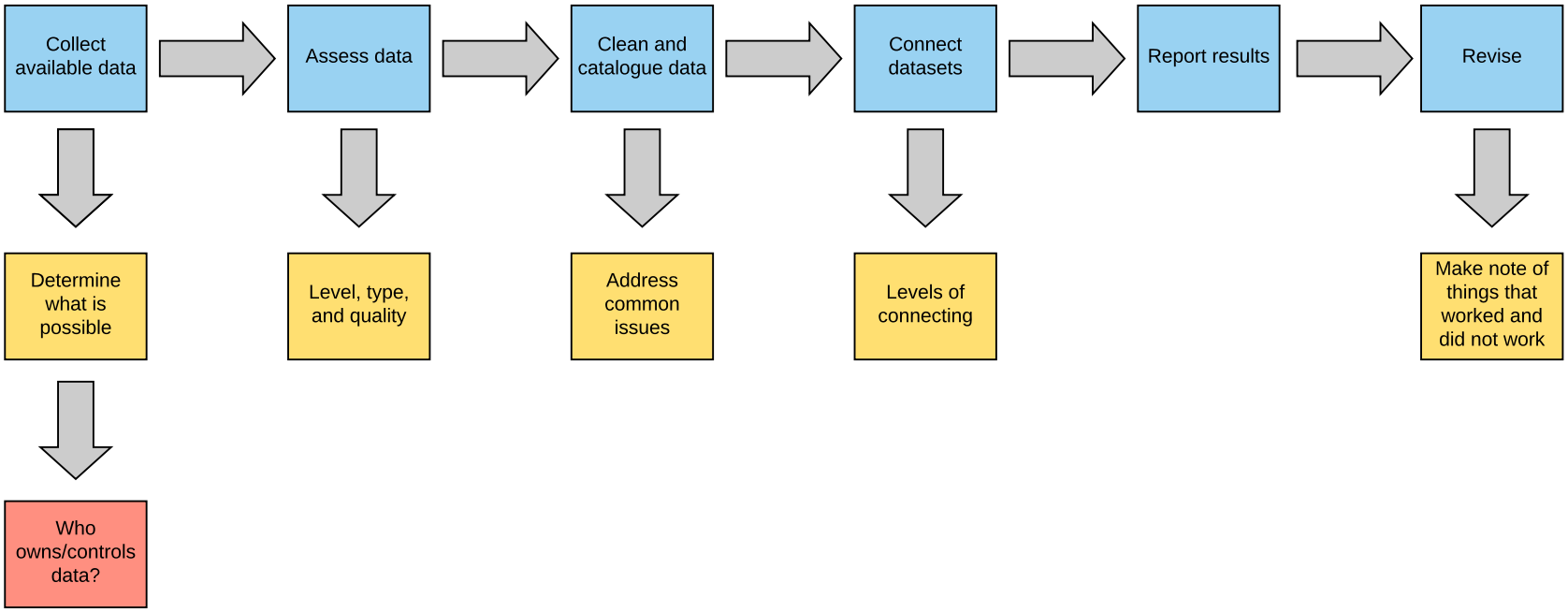
_____

Q41 How many years have you been with Extension?

	0	4	8	12	16	20	24	28	32	36	40
Click to write Choice 1 ()											

End of Block: Default Question Block

APPENDIX E


Collect available data
Assess data
Clean and catalogue data
Connect datasets
Report results
Revise
Determine what is possible
Level, type, and quality
Address common issues
Levels of connecting
Make note of things that worked and did not work
Who owns/controls data?