THE 2013 FLOODS IN BOULDER COUNTY COLORADO: AN ANALYSIS OF GOVERNMENTAL AND FAITH-BASED ORGANIZATIONS' POST-DISASTER PLANNING FOR HOUSING RECOVERY

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF PHILOSOPHY
May 2017

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ACKNOWLEDGEMENTS

I dedicate this work with my sincere thanks and gratitude to my families. First and foremost; Carol, Megan, Alyssa, Alexis, Ryan and Keenan, who inspired, supported, and equipped me for this journey. My nuclear family, Marge, John, Barbara and Mark who sparked my love of learning and design. My academic family, committee, cohort, and especially my advisor Tristan, who guided, focused, and encouraged me. To my fire service family who is transforming firefighting from a trade to a profession - Denis, Chuck, Charlie, John, Theresa, Mark, Bob, Troy, Mike, Vince, Forest, and Tim. Finally, to the countless others who've shared an emergency scene, firehouse, drill ground, classroom, or boardroom with me. I am forever in your debt, Ná géill choíche!

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Date of Degree: MAY 2017

Title of Study: THE 2013 COLORADO FLOODS IN BOULDER COUNTY COLORADO: AN ANALYSIS OF FAITH-BASED ORGANIZATIONS' POST-DISASTER PLANNING FOR HOUSING RECOVERY

Major Field: FIRE AND EMERGENCY MANAGEMENT

Abstract: Recovery is an understudied and costly phase of a disaster. Housing recovery, a key aspect of a community's recovery, is investigated in this research. As disasters evolve into recovery, post-disaster recovery planning for government organizations (GOs) reportedly builds on the structure of response planning using the National Planning System (NPS). The involvement and importance of faith-based organizations (FBOs) in permanent housing recovery permeates the literature. FBOs' recovery effectiveness and efficiency were reported by some researchers to surpass that of GOs. The purported difference in the performance of FBOs and GOs was attributed to FBOs' freedom from rigid structure and the personal commitment of their personnel. However, the Post-Disaster Recovery Planning process (PDRP) of FBOs is conspicuously absent from the literature. This mixed methods study addressed this deficit in the knowledge base. The research investigated NPS in GO and FBO PDRP along with the perceived effectiveness and efficiency of PDRP for both types of organizations. The study found that (a) NPS exists in both GO and FBO planning and (b) householders' perceived level of information availability and ease of process navigation was higher for GOs than for FBOs in this disaster recovery. There were no significant differences in perceptions that FBOs and GOs were there to help householders with recovery. The research set the stage for future studies to investigate whether similar NPS and perceptions exist in other recoveries and to explore why the differences between historic literature and results in this housing recovery exist.

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LIST OF ABBREVIATIONS

ANOVA	Analysis of variance
COVOAD	Colorado Voluntary Organizations Active in Disaster
EOC	Emergency operations center
FBO	Faith-based organization
FEMA	Federal Emergency Management Agency
FRC	Flood recovery center
FRP	Flood-related permit
GO	Governmental organization
HUD	Housing and Urban Development
IAP	Incident action plan
ICS	Incident command system
IHP	Individual and Housing Program
NDRF	National disaster recovery framework
NFIP	National flood insurance program
NGO	Nongovernmental organization
NIMS	National incident management system
NPS	National planning system
PDRP	Post-disaster recovery planning
SBA	Small Business Administration
WUI	Wildland urban interface

CHAPTER I

INTRODUCTION

This chapter presents an overview of research conducted to analyze post-disaster recovery planning processes used by governmental and faith-based organizations (FBO) in connection with the 2013 Colorado floods. The chapter presents background information along with statements of the problem, purpose, and significance of the study. Additionally, key terminology and definitions used in the study are introduced.

1.1 The 2013 Colorado Floods

September 11, 2013 marked the 12th anniversary of terrorist attacks on the World Trade Center. However, this date will long be remembered in Colorado for a very different reason. Catastrophic flooding peaked on this day and damaged 17,983 homes, destroying 1,882 of them (Fekete, 2009; Gochis et al., 2015). This was the largest disaster and the greatest loss of permanent housing stock in Colorado's history (Lagabrielle et al., 2014).

Historically, Colorado has not been immune to devastating natural disasters; most of Colorado' disaster experience has been caused by wildfires (Floyd, Romme, & Hanna, 2000). In 2012, the Waldo Canyon wildfire set a record destroying 340 homes in and around Colorado Springs (Garza & Freeman, 2014); the very next year, the Black Forest Fire set a new record, destroying 511 homes. These disasters represented the largest loss of permanent housing in Colorado's history prior to 2013 (Gochis et al., 2015); however, the 2013 Colorado floods

eclipsed both these disasters by a large margin.

Many newscasts and publications designated the 2013 floods as a 1,000-year flood (Dashti et al. 2014; Emerson 2015, Sutton, 2015). The National Oceanic and Atmospheric Administration reported that the three-day total rainfall ending on September 12, 2013 exceeded any monthly total recorded in Colorado since recordkeeping began in 1897 (Scott, 2013).

Recovery efforts following the floods involved resources from local, state, federal, and nongovernmental organizations. Executive orders from the Governor of Colorado triggered involvement of state resources and agencies. At the federal level, the National Disaster Response Framework (NDRF) mandates that governmental organizations (GOs) provide assistance once a Stafford Disaster Declaration is signed. In the aftermath of the 2013 Colorado floods, President Obama signed the necessary declaration, authorizing the Federal Emergency Management Agency (FEMA) to assume a key role in orchestrating overall recovery efforts. The recovery was coordinated by Joint Field Offices established in several Colorado locations; local coordination was organized at the county level. The crucial difference between wildfire disasters and the 2013 Colorado floods can be summed up in a single word: insurance.

The 2013 flooding in Colorado is unique because so many of the houses that were destroyed were uninsured (Coffman, 2013). The high volume of uninsured loss in this disaster was primarily driven by several insurance-related issues. Unlike previous wildfire disaster events that usually affected insured, more expensive homes in the Wildland Urban Interface (WUI), the 2013 floods destroyed many uninsured or underinsured homes. Moreover, much of the damage was caused by events “excluded” from homeowners’ policies, such as the cascading effects of torrential rains including landslides. Homes located outside the 100-year floodplain are not required to have flood insurance purchased from the National Flood Insurance Program (NFIP)

(Knowles & Kunreuther, 2014); therefore, many homeowners had chosen not to carry flood insurance.

Disasters often affect the poor and elderly more severely than other population groups. Their vulnerability is exacerbated by domicile location, substandard construction, and the lack of resources and insurance needed to rebuild (Lowe, 2012). In this disaster, many older homeowners lived near waterways in unincorporated Boulder County (Crow, 2014). In the U.S., FBOs play a major role in permanent housing recovery following disasters (Comerio, 1997; Quarantelli, 1995). FBOs often assist elderly and poor populations in re-establishing permanent housing (Hayles, 2010; Zhang & Peacock, 2010).

1.2 Problem

The problem investigated in this study is simply stated: How do the planning processes that governmental organizations (GOs) and FBOs use for permanent housing recovery compare? Prior to the 2013 floods, FBOs typically provided minimal assistance with permanent housing recovery following Colorado disasters because most losses were from wildfire, and homeowners were usually insured against that type of loss. However, following the 2013 Colorado floods, FBOs had much greater involvement due to the high number of uninsured losses. Therefore, this study investigates both GO and FBO planning processes for housing recovery. Investigations into disaster recovery are less prevalent in the literature than studies of other phases of disasters, namely mitigation, preparedness, and response. Recovery is the least studied and the costliest phase of a disaster (Ganapati & Ganapati, 2009; Phillips, 1997).

This researcher utilizes the term *post-disaster recovery planning (PDRP)*, which is defined in the NDRF (Federal Emergency Management Agency, 2016), as an all-inclusive term

to address the planning processes being researched herein. The central focus of this study is on investigating specifically how FBOs organize and plan for permanent housing recovery once they have selected and embarked on a disaster mission.

Permanent housing recovery following disaster is a worldwide mission for many FBOs, and people at most risk often rely on FBOs for assistance when disaster strikes (Bolin & Stanford, 1998; Lowe, 2012; Lu, 2008). Vulnerable populations are often uninsured or underinsured and, for a variety of reasons, often do not seek government aid. The literature is clear: FBOs frequently assist vulnerable populations with permanent housing recovery (Carmel, Paz, Jahashan, & Shoshany, 2009; Comerio, 1998).

What is unclear is how FBOs plan for the execution of this important mission. This study investigated this understudied area of disaster recovery. Hector (2010, p. 13) states that "further research needs to be conducted to develop planning models, methods and procedures for these types of agencies." This research investigated PDRP for GOs and FBOs participating in permanent housing recovery following the 2013 Boulder floods. It was conducted as a bounded case study, which may provide the context for a greater understanding of PDRP.

Governmental programs and private insurance assist many to recover from disasters. For others, FBOs fill a key role in housing recovery. They fill a need that arises from receding governmental presence and increasing unmet needs (Luna, 2001). Emergency shelter and temporary housing planning processes build upon command and control used in the emergency phases of disaster (Birkland, 2009). However, as disaster recovery evolves, planning becomes less formal (Hayles, 2010).

The literature is limited in its discussion of planning processes used by governmental agencies as disaster response transitions to recovery. Hector (2010) suggests a combination of

poor planning, inexperienced volunteers, and the complexity of post-disaster conditions may add confusion during the recovery effort. It is imperative that nongovernmental organizations' planning and execution be as effective and efficient as possible to provide the greatest good (Kates, Colten, Laska, & Leatherman, 2006).

1.3 Rationale for the Study

Planning for permanent housing recovery has the potential to improve efficiency and effectiveness of this core aspect of disaster recovery. In the context of disaster recovery, the term *planning* likely evokes images and thoughts of pre-disaster plans. However, this dissertation focuses on understanding the post-disaster planning that happens in the field when GOs and FBO engage in housing recovery. Therefore, a working definition of planning was needed. The definition developed by Mintzberg was used to specify, "working out in broad outline the things that need to be done and the methods for doing them to accomplish the purpose set for the enterprise" (1981, p. 319).

This dissertation uses a case study focusing on FBOs and GOs involved in permanent housing recovery following the 2013 Colorado floods. Interview and questionnaire are used to collect data in this is a mixed methods dissertation using a bounded case study. This research provides information that may ultimately increase the efficiency and effectiveness of permanent housing recovery. This study adds to a particularly understudied area of the knowledge base. Through increased awareness of PDRP, both FBOs and GOs have the potential to improve permanent housing recovery.

CHAPTER II

REVIEW OF THE LITERATURE

2.1 Permanent Housing Recovery

The need for housing recovery is common to all disasters (Bolin & Stanford, 1998; Comerio, 1997) and, beyond simply replacing dwellings, housing recovery is a central element of a community's overall recovery (Comerio, 1997, 2015; Lu, 2008; Zhang & Peacock, 2010). Housing recovery cannot be considered as a standalone process; it is interrelated with other aspects of recovery and integral to rebuilding a community. (Comerio, 1998, 2015; Gotham & Campanella, 2011; Lu, 2008).

Recovery takes substantial time as compared to the fast-evolving response and emergency phases of a disaster. The Recovery Federal Interagency Operational Plan mentions that it is not unusual for permanent housing recovery to take up to 10 years following a disaster (Federal Emergency Management Agency, 2014). Dynamic tension exists between a community's desire for quick replacement of lost housing and the need for careful, deliberate planning to achieve the most desirable results (Lu, 2008; Olshansky, 2006; Olshansky, Johnson, Horne, & Nee, 2008; Olshansky & Johnson, 2014; Zhang & Peacock, 2010).

Immediately following disasters, shelter is a high priority; however, emergency and temporary shelter is only a fraction of overall housing recovery (Hayles, 2010; Oliver-Smith, 1990). The continuum of housing recovery following disaster includes emergency shelter, temporary shelter, temporary housing, and permanent housing. Individuals who must re-establish permanent housing following disaster include renters, homeowners, and those in congregate housing. (Davidson, Johnson, Lizarralde, Dikmen, & Sliwinski, 2007; Fussell, 2015; Hayles, 2010).

Housing recovery is cited as foundational and an essential element of recovery (Tagliacozzo & Magni, 2016; Zhang & Peacock, 2010). Hayles offers a working definition of permanent housing salient to this dissertation. According to Hayles, permanent housing occurs with "disaster victims returning to either their rebuilt homes or moving into new quarters but, in both cases, the moves involve occupying permanent, residential facilities" (2010, p. 3). Taheri Tafti and Tomlinson define permanent housing recovery as "achieving a housing condition equal to, or preferable to the ex-ante condition in terms of housing quality, tenure, location, and affordability" (2013, p. 218).

2.2 Governmental Housing Recovery Models

The approach to housing recovery spans a broad continuum from strict federal relocation programming to a purely market approach. With a purely market approach, the government does not take an active, direct role; instead, it relies on homeowners to use their resources, insurance, and private capital to rebuild (Parkins & MacKendrick, 2007). Comerio (1998) lists four models for housing recovery: redevelopment, capital-infusion, limited-intervention, and market. A summary of each model is presented here, not as a comprehensive investigation, but as context

for understanding post-disaster planning as it relates to permanent housing recovery in this research.

In the redevelopment model, recovery is led and funded at the federal level. The literature suggests this process is common in disaster recovery efforts outside the United States. The comprehensive redevelopment following the Chi-Chi 1999 earthquake in Taiwan (Shao & Turumi, 2008) is an example of the failures often cited in the redevelopment model. This model suggests strong oversight and control from governments, complete with rigid guidelines. Research suggests that this model places greater importance on the process than the people who will occupy the rebuilt homes. The strict use of this model resulted in seven indigenous tribes being relocated to unfamiliar settings and structures after the 1999 Chi Chi earthquake (Shao & Turumi, 2008).

Literature suggests capital-infusion and limited-intervention models are commonly used in disaster recovery in the United States (Oliver-Smith, 1990). In the capital-infusion model, outside monies, typically from government and volunteer organizations, are infused into communities (Zhang & Peacock, 2010). In the literature, this model is also referred to as *infusion of aid*. (Chang, Wilkinson, Potangaroa, & Seville, 2011). In the limited-intervention model, a greater burden is placed on the homeowner whereby recovery is funded through insurance or private funds with limited government assistance.

The market model is essentially a hands-off approach in which the homeowner is tasked with handling recovery without assistance from local, state, or federal agencies. This may be thought of as a purely capitalistic model in which market conditions drive recovery; use of this model may result in clear winners and losers. (McMullen, 2011).

It is important to note that in each disaster scenario, multiple housing recovery models often operate concurrently. The U.S. government pushes the execution of housing recovery towards the market model (Zhang & Peacock, 2010). Thus, recovery funding is expected to come from insurance, loans, and savings (Comerio, 2015; Zhang & Peacock, 2010). This approach also aligns with the description of the limited-intervention model, in which a blend of public and private funds, typically from loans, is used to finance housing recovery. However, these loans create debt that must be repaid by the householder. (Bolin & Stanford, 1998; Comerio, 1997).

2.3 Perspectives on Nongovernmental Disaster Recovery Planning Processes

The literature suggests that FBO planning processes for permanent housing recovery vary dramatically from organization to organization and from one disaster to another (Kates et al., 2006). The literature describes housing recovery as a slow process (Kim, Marshall, & Pal, 2014; Olshansky et al., 2008). Much of the literature on permanent housing recovery is focused on disaster recovery outside the U.S., such as the 2004 Indian Ocean tsunami and the 2010 Haiti earthquake (Comfort et al., 2011; Kapadia, 2008; Murao & Nakazato, 2010; Ritchie & Tierney, 2011).

Nongovernmental planning processes for permanent housing recovery is generally cited as being loosely structured and often ad hoc (Davidson et al., 2007; Mitchell, Esnard, & Sapat, 2012). Acosta and Chandra (2013) suggest FBOs have greater flexibility as they operate outside rigid governmental structures and can shift to meet the changing demands of disaster recovery. Any attempt to force governmental structures such as the National Incident Management System (NIMS) or the Incident Command System (ICS) on individuals or organizations who do not typically use them is cited as a limitation (Buck, Trainor, & Aguirre, 2006; Hayles, 2010).

Literature on U.S. permanent housing disaster recovery focuses heavily on hurricanes Katrina, Rita, and Sandy (Hayles, 2010; Kates et al., 2006; Lowe, 2012; Olshansky & Johnson, 2014; Pyles & Harding, 2012). In each of these disasters, the role of FBOs constituted a substantial portion of all permanent housing recovery efforts. Discussions of PDRP processes for permanent housing recovery mostly consist of general references to NIMS or loosely coupled or ad hoc processes (Davidson et al., 2007; Mitchell et al., 2012).

Planning processes for all aspects of disaster recovery are declared to be vital and are touted as essential for improving outcomes (Bayansalduz, 2012; Oliver-Smith, 1990). Garnett concurs and suggests organizations should "Develop an outcomes-oriented approach to disaster recovery planning, and plan for measurement of outcomes" (2010, p. 15).

The relationship between deliberate planning methods and the ultimate success of housing recovery is cited in the literature (Chang, Wilkinson, Brunsdon, Seville, & Potangaroa, 2011; Olshansky, 2006; Zhang & Peacock, 2010). Chang, Wilkinson, Brunsdon, et al. suggest that a structured planning framework is most effective when ensuring "coordination of organizations charged with response and recovery" (2011, p. 740).

In summary, most existing literature on planning for housing recovery focuses on emergency and temporary shelter immediately following a disaster. Four models are cited as typical approaches to housing recovery: redevelopment, capital-infusion, limited-intervention, and market models. U.S. housing recovery has less direct governmental oversight than disaster recovery in other countries; typically, a capital-infusion or limited-intervention model is used in disaster recovery in the U.S. Some researchers suggest the U.S. housing recovery could follow a market-driven model with even less intervention.

2.4 GOs in Permanent Housing Recovery

The U.S. governmental organization paradigm encourages pre-disaster planning as a means of supporting housing recovery. The FEMA has a formalized process, known as pre-disaster mitigation, which in turn requires states to create their own multi-hazard, pre-disaster mitigation plans. Research shows that most states comply with this FEMA requirement (Carr, 2007; Yoon, Youngs, & Abe, 2012). Colorado had local and state pre-disaster mitigation plans in place before the 2013 floods (Rumbach, Makarewicz, & Nemeth, 2016). However, most Colorado pre-disaster plans dealt with wildfire, and many were community wildfire protection plans (Mockrin, Stewart, Radeloff, & Hammer, 2016).

The U.S. government's role in recovering permanent housing was first referenced in the Disaster Relief Act of 1950 and subsequently clarified in the 1988 Stafford Act (Sylves, 2008). The Disaster Relief Act of 1950 solidified federal involvement in disaster response and recovery (Platt, 1999). This foundational legislation continues to permeate current federal housing recovery assistance. Section 408 of the Stafford Act outlines assistance to citizens, that is, individual assistance. In 2010, Hayles stated:

> The final form of housing assistance under Section 408 is replacement assistance. This aid is intended for disaster victims whose homes have been destroyed by the disaster event. Funds can be used toward the purchase of a new residence to replace an owner-occupied private residence destroyed by the major disaster or emergency . . . when this provision was originally added to Stafford Act authorities, it was capped at $10,000 but, as with repairs, the cap was removed by the PKEMRA [Post-Katrina Emergency Reform Act] and replacement grants can now be up to $25,000, as adjusted. (p. 11)

The Department of Homeland Security's NDRF (2016) provides direction for disaster recovery: "Planning for current and post-disaster requirements are [sic] integrated into the organizations at the local and state level." The Department of Homeland Security suggests a formal planning process for emergency response and initial emergency actions related to housing recovery. This system of organization, process, focus, and planning is primarily outlined in what is collectively referred to in this study as the *National Planning System (NPS)*. This structured system of planning is referred to in both the National Response Framework and the NDRF.

2.5 Governmental Recovery Planning Processes

U.S. government planning processes are consistent throughout the phases of a disaster (Zhang & Peacock, 2010); planning for emergency shelter and temporary shelter is outlined in the National Response Framework (Federal Emergency Managment Agency, 2008). The framework encompasses a standardized process called the *Planning P*, which outlines cyclical processes and provides structure for planning. In this process, operational periods are defined, and a series of meetings, briefings, and associated paperwork guide action. The Planning P is shown in Figure 1-1.

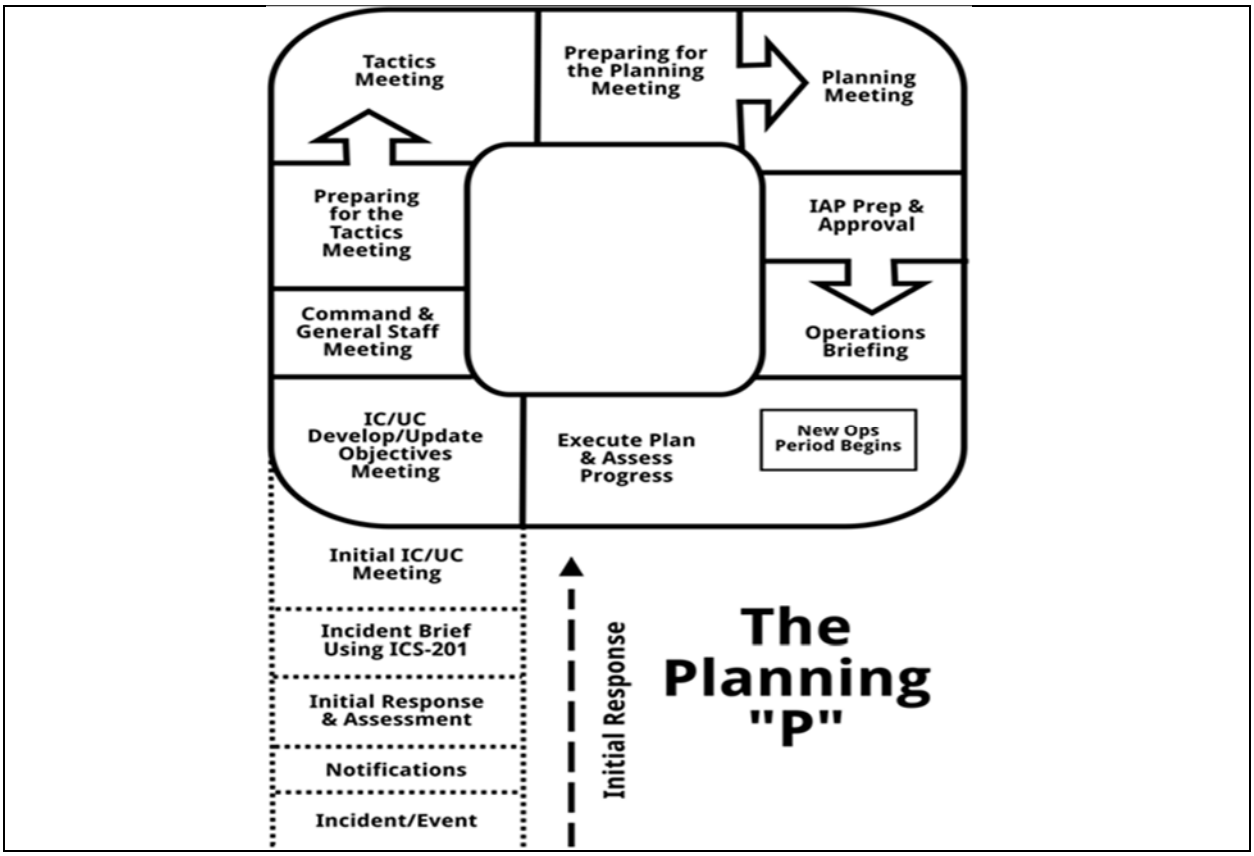

Figure 1-1. The Planning P. Reprinted from Federal Emergency Management Agency, 2008.

Temporary and permanent housing recovery is outlined in the NDRF (Federal Emergency Management Agency, 2016), which prescribes structured planning processes with emphasis on command and control. Planning is cited as an important and essential element for successful recovery (Chang, Wilkinson, Brunsdon, et al., 2011; Chang, Wilkinson, Potangaroa, et al., 2011).

U.S. government planning processes for disaster recovery are outlined in the NDRF and the Recovery Federal Interagency Operational Plan. These documents assert that efficiencies and effectiveness are increased with the use of highly structured processes. The literature suggests that processes used by governmental organizations adhere to rigid planning structure outlined in the Incident Command System (ICS) (Neal & Phillips, 1995). However, forcing this structure on individuals and organizations who are not accustomed to it may prove to be counterproductive

(Buck et al., 2006). The literature also suggests a steady increase in the amount of recovery planning with each successive U.S. disaster *(*Davidson et al., 2007*)*.

Another challenge cited in the literature is receding governmental assistance and a mismatch between governmental programs and citizens' needs. The literature on long-term housing recovery suggests state and federal government involvement decreases as time passes after a disaster (Bolin & Stanford, 1998,; Hayles, 2010).

The literature includes reports that the government sometimes disengages operationally when citizens most need assistance (Bolin & Stanford, 1998; Oliver-Smith, 1990). The literature also suggests that the greatest amount of assistance is sometimes provided to those who apparently need it the least, such as insured homeowners and those in the middle- and upper-classes. Low-income, minority, and elderly populations are often passed over in the process (Carmel et al., 2009; Comerio, 1998; Oliver-Smith, 1990). In a more critical view, Hayles (2010) proclaims local officials are ill-prepared for assisting residents in navigating the federal bureaucracy of permanent housing recovery.

2.6 Government Disaster Recovery Structure and Management

The National Incident Management System (NIMS) builds upon the structures of ICS, which began as a method of organizing responders and was first used with California wildfires in the 1970s. The system, originally called Firescope (Stambler & Barbera, 2011), was designed to integrate multiple agencies and resources responding to large wildfires. The system had great success (Vidal & Roberts, 2014) and became a springboard for the NPS and the standard structure for organizing disaster recovery resources.

This section of the literature review presents a synopsis of the organizational structure and personnel roles typically deployed in the NPS. This synopsis is by no means a comprehensive review of all the elements of the governmental disaster recovery system; it is presented here to give the reader some insight into the scope of the structure, planning, and staffing involved in the NPS.

Using ICS protocols, each disaster incident is divided into five functions regardless of whether it is in the response or recovery phase. These functions consist of command, finance, logistics, operations, and planning (Guster, Lee, & McCann, 2012). Resources are organized by function and tasked with responsibility for each section of the incident. For example, the planning section is responsible for setting a plan to accomplish identified objectives (Bigley & Roberts, 2001). The plan is then executed by the operations section, supported by the logistics section, and funded by the finance section.

The command staff, which provides oversight for the entire incident, consists of a section chief for each of the functions or sections of the incident. For example, the planning section is overseen by a plans section chief who distills the incident objectives into an actionable plan, known as the Incident Action Plan (IAP). The plans section chief is also responsible for coordinating documents and meetings to support planning, briefing, and debriefing.

Each section has additional structure below its section chief, which includes supervisors of each group (function) or division (geographic area). Division or group supervisors oversee the functions or actions below them. Additionally, field observers may be needed to gather information and intelligence, which they relay to their supervisors.

The scalability of ICS is touted as a strength. If an event is large and has multiple sites or incidents, an overall incident or area commander directs the response and recovery efforts. In extremely large incidents, such as the Katrina recovery, multiple area commanders may be required. (Guster et al., 2012).

The disaster response-recovery planning process is guided by an overall cycle, introduced in Figure 1-1 as the Planning P. The process is cyclical, and the purpose of each progressive planning cycle is to produce an IAP for the upcoming operational period. Early in the response phases of disaster planning, cycles most often occur twice per day, in a 12-hour cycle. One IAP is typically produced for daytime operations and another for nighttime operations. As a disaster evolves, planning cycles are extended. In events such as the long-term housing recovery from Hurricane Sandy in the eastern U.S., operational periods covered much longer time frames (Nejat & Ghosh, 2016).

The role of local government is discussed in the NDRF. Guidance is suggested in three areas: strategic, operational, and tactical. The framework document provides direction for local government to set objectives and involve stakeholders from the community and governance in support of these three areas (Federal Emergency Management Agency, 2016). Documents and systems of organizing personnel exist in the ICS. These documents are produced during the planning cycle and included in the IAP, or in the case of recovery, in a recovery plan.

2.7 Vulnerable Populations and Mistrust in Public Assistance

In the context of disaster recovery, age is considered a vulnerability for many reasons including higher prevalence of disability, reduced mobility, and special needs (Marcelin, Homer, Ozguven, & Kocatepe, 2016). Social isolation is also a contributing factor as older adults typically have smaller social networks (Cutter, Boruff, & Shirley, 2003). Additionally, the limitation of a fixed income and the need for family support contributes to increased vulnerability (Inouye, Barham, Pedrazzani, & Pavarini, 2010).

Physical proximity to risk, such as residences near waterways, is shown to increase risk, especially for the elderly (Fekete, 2009). In the literature, the impact of disaster on those living in high-risk locations is often described as severe. Kusumasari and Alam described a situation in which vulnerable populations were dramatically impacted by an earthquake in Banjul Indonesia because “victims of the quake lived in the lowest quality housing, in the worst locations, and had the fewest opportunities to recover from the disaster” (2012, p. 361).

Besides being exposed to greater impact of disaster because of proximity to risk, vulnerable populations often do not seek government assistance. Race, ethnicity, age, and lower income often correlate with difficulty or deterrence in attaining post-disaster housing replacement (Hayles, 2010). Examples of these populations being slighted in the housing recovery process are plentiful in the literature.

The 1994 Northridge earthquake in California is an example of disaster recovery inequity. The Latino community was especially hard hit by this earthquake, and they struggled with the housing recovery process. Traditionally, Mexican immigrants have been excluded from recovery following California disasters (Bolin & Stanford, 1998). The political climate in

California is cited as a deterrent preventing minorities who qualify for federal aid from applying for assistance (Menchacha, 1995). One possible reason for their reluctance is that FEMA requires Individual Aid applicants to declare resident status. Bolin and Stanford (1998, p. 27) reported the all-too-common fears of legal immigrant workers: “many Latinos around here think the federal government can just load them up in box cars and ship them off to Mexico no matter how long they’ve lived here.” Following the 1994 Northridge earthquake, members of the Latino community were reluctant to apply for housing recovery assistance. Bolin and Stanford stated that “Recent Mexican immigrants, lacking experience with previous California disasters, and lacking knowledge about federal bureaucracy and their own legal entitlements were reluctant to avail themselves of public resources to assist in their disaster-related needs” (1998, p. 26).

The process for securing federal funding is confusing, especially for those who have language barriers or underlying fear of governmental intervention. These populations are often left out of the process. Bolin and Stanford cited efforts following the 1994 Northridge earthquake “To attract victims legally entitled but reluctant to use the relief network took efforts of community activists, often working through NGOs [nongovernmental organizations] and CBOs [community-based organizations] in outreach and counseling activities” (1998, p. 26).

Parkins and MacKendrick describe the problem generally stating that “minority and lower- income neighborhoods often fall short of receiving the necessary aid to jump start the recovery process” (2007, p. 2). Bolin and Stanford concur describing Mexican immigrant populations who, following California disasters, “failed to obtain adequate relief. These unmet needs relate to the vulnerability of particular class and ethnic groups” (1998, p. 21).

In summary, vulnerable populations are typically underserved in permanent housing recovery following disaster. This deficit may stem from a lack of knowledge or understanding of programs available. More often, reluctance to apply and pursue assistance is grounded in fear. The 1994 Northridge recovery provided examples of race and income as factors influencing recovery.

2.8 FBOs in Permanent Housing Recovery

Inadequate or inaccessible public assistance, limited financial resources, and the absence of appropriate insurance create a difficult recovery situation for many. Furthermore, a lack of awareness or mistrust in public assistance narrows options for vulnerable populations. The severity of their needs leads many homeowners to seek assistance from FBOs for permanent housing repair or replacement. FBOs often find those in most need through local community and church outreach programs. Quarantelli provided some insight into the assistance provided by FBOs in permanent housing recovery:

> Some religious groups in American society (e.g., the Mennonites or Interfaith) have made it part of their organizational mission to provide post-disaster assistance including rebuilding and providing of permanent housing. Which criteria such groups use for designating those to be given help, and how well the aid is used has not been studied (except to some extent for the Latter-Day Saints or Mormons as they are popularly known). In fact, there has been no systematic inventorying of such groups although some of the major ones are linked into an informal contact network. (1995, p. 50)

Many FBOs are heavily involved in permanent housing recovery following disasters. Ironically, the literature shows an unexpected void in the study of the processes that FBOs use to

deploy, execute, and plan for permanent housing recovery. Of particular interest to this researcher is the lack of literature on post-disaster recovery planning by FBOs. With numerous FBOs proclaiming housing recovery as a core mission, the lack of literature is puzzling. Thus, one of the questions central to this study is this: Why is research on FBO planning for housing recovery so limited?

There are several theories as to why FBOs, often referred to as religious organizations (ROs) or religious nongovernmental organizations (RNGOs), are understudied. Berger states that "many governments are hostile to the 'religious' and 'NGO' dimensions . . . some governments see the values 'imported' by RNGOs as both a threat and an imposition" (2003, p. 35). Hearn (2002) also refers to religious organizations as invisible in overall discussions of foreign assistance. McLeigh states that "the roles of ROs remain underspecified, under-researched, and generally neglected by mainstream NGO and civil society research" (2011, p. 56). The literature also suggests that FBOs are reluctant to participate in research or share information (Dossett, Fuentes, Klap, & Wells, 2005, Murphy, 2016).

According to McLeigh, "What remains particularly striking about this topic is that so little academic attention has been placed on ROs, particularly in how they compare to their secular counterparts . . . . these organizations have been overlooked because of the lack of definition of faith-based, the hesitation of the organizations themselves to acknowledge and embrace their religious character due to public stigma, and the possible impact such an acknowledgment could have on receiving government funds" (2011, p. 55).

From the literature review, it is unclear whether the NPS processes are integrated into FBO planning processes. Correlation of NPS and FBO effectiveness and efficiency in permanent

housing recovery were not directly discovered in the literature. This gap in the knowledge base is confounded by conflicting viewpoints on the importance of formal structure in planning for recovery. The literature includes references to the importance of having FBOs partner with local entities (McCabe et al., 2014; Sakai, 2012; Stajura et al., 2012). Such partnerships combined with FBOs' flexibility in structure and execution are said to increase FBO effectiveness (Forgette, Dettrey, Van Boening, & Swanson, 2009).

2.9 Summary

The literature articulates the importance of permanent housing recovery as an overall contribution to a community's post-disaster recovery. Literature on planning processes focuses primarily on the emergency phases of disaster housing recovery. The NPS, which rich in ICS structure, is said to be the default planning model used for response, and its use extends into governmental PDRP processes.

In the U.S., GOs support housing recovery by encouraging pre-disaster plans and by providing a standardized planning process, the NPS. The U.S. government is also a stakeholder when unmet needs are identified as disaster response transitions to disaster recovery. In the U.S., market or capital-infusion models are widely used to address permanent housing recovery needs with financing provided by some combination of insurance, loans, and savings. That is not to say that the U.S. government is entirely hands-off in permanent housing recovery. Some small grants, less than $5,000, are available for repairs, and under the Post-Katrina Emergency Reform Act, grants as high as $25,000 may be awarded.

However, individuals and families in the U.S. cannot rely solely on the government for housing recovery (Davidson et al., 2007; Hayles, 2010). FBOs fill a void in permanent housing

recovery, and this is core mission for many FBOs. Vulnerable populations are the most severely impacted due to the location, condition, and uninsured or underinsured status of their homes. According to the literature, vulnerable populations affected by disaster exhibit significant mistrust of government assistance programs.

The literature suggests that FBOs are frequently more agile and possibly more effective than GOs following disaster (Davidson et al., 2007; Neal & Phillips, 1995; Scolobig, Prior, Schroter, Jorin, & Patt, 2015). Planning processes used by FBOs for permanent housing recovery is an understudied aspect of disaster research. Perceptions of comparative efficiency and effectiveness of FBO PDRP for housing recovery were not discovered in the literature. GOs support housing recovery in the U.S. primarily by encouraging pre-disaster plans.

CHAPTER III

RESEARCH OBJECTIVES AND STUDY DESIGN

Two overarching research objectives are foundational in this research. The first objective relates to the presence of NPS in PDRP for both GOs and FBOs, and the second objective relates to the perceived effectiveness and efficiency of PDRP. This chapter discusses these research objectives and presents the study design for this mixed-methods approach for collection and analysis of qualitative and quantitative data.

3.1 Research Objective 1: NPS Structure in PDRP

The first objective sought to determine if NPS elements were present or absent in PDRP. Since both GOs and FBOs were involved in this recovery, this research investigated the PDRP for both types of organizations. The literature suggests that GOs' PDRP process includes NPS. Conversely, much of the literature suggests loosely structured or ad hoc organizational systems and planning exist for FBOs involved in housing recovery.

The research objectives for GOs are articulated in the context of the NPS. The structure of NIMS and the ICS clearly articulate the default governmental planning process, referred to collectively in this study as NPS. In disaster response, the Planning P is engaged in planning cycles as short as 12 hours. As the disaster evolves and response stabilizes, the operational planning period lengthens. In long-term recovery efforts, such as the ongoing recovery from Hurricane Sandy in 2012, operational planning periods may span months and even years

(Marshall, 2014). This study seeks to find if PDRP for GOs contained NPS elements and built upon the planning systems in place for recovery in this disaster. Interviews were conducted to gain a greater understanding of the extent to which GOs adhere to or deviate from the NPS for PDRP. Perceptions about the effectiveness and efficiency of PDRP were gathered from participants involved with GOs and FBOs.

The first research objective for FBOs is to determine whether NPS exists in PDRP for housing recovery in this disaster. Minimal literature describing planning for housing recovery in the FBO paradigm was discovered. What was uncovered were references to the ideas that FBOs' loosely coupled systems produce superior results. The literature suggests that the motivation and commitment of FBO personnel is an element that may contribute to higher levels of performance. Simply stated, this research objective is to gain insights into the existence, or absence, of NPS in permanent housing recovery.

3.2 Research Objective 2: Perceived Effectiveness and Efficiency of PDRP

The second research objective sought to measure perceptions of PDRP effectiveness and efficiency. Perceptions of GO personnel were gathered through interview to describe their perceptions of effectiveness and efficiency of PDRP. These questions were asked without reference to organizational structure. The GO personnel queried were from local, state, and federal levels. They were asked about their perceptions of effectiveness and efficiency of PDRP at various levels of government.

Similarly, FBO personnel were asked about the effectiveness and efficiency of their organizations' PDRP. As with GOs, these questions were asked apart from questions about

organizational structure. Literature review suggests FBO recovery efforts are often more efficient and effective than those of GOs.

The research objectives for householders focused solely on research objective 2. Perceptions of effectiveness and efficiency of both GOs and FBOs meetings and householders' overall experience with GOs and FBOs during flood recovery were gathered through survey. Householders applying for flood related permits (FRPs) were sent questionnaires via the United States Postal Service. Because data collected from the Boulder County Building Department did not include email contact information, direct mail was the best means for initial contact with this population. Specifically, this population was defined as all households seeking FRPs following the 2013 floods as articulated by a metatag of "FRP" in the Boulder County Building Department records management system. The FRP metatag was added to each permit associated with recovery from the floods. Through a records request, this researcher retrieved the permit information and mailing addresses for this population. Using the Dillman (2007) mail survey protocol, the survey was mailed to the identified households in four waves.

Questionnaires were tallied and responses analyzed using the statistical software IBM SPSS (Statistical Package for the Social Sciences). A power analysis of all quantitative data was completed to determine the strength of the data and conclusions. For data with sufficient power, appropriate multivariate data analysis was completed. Research hypotheses and independent and dependent variables were created to support the research objectives.

3.3 Study Design

The design of this study blends qualitative and quantitative methodologies to investigate an understudied area of disaster recovery. A case study focusing on permanent housing recovery

in Boulder County Colorado provides the context for the study. The case study was selected because of the unique nature of damage and loss of homes in the 2013 Colorado floods. Both GOs and FBOs were involved in this recovery because up to 90% of the impacted homes were uninsured.

Three distinct and interrelated populations were queried. Samples from the population of GOs and FBOs were interviewed about their perspectives on housing recovery. Additionally, surveys were administered to query households' perceptions of GOs' and FBOs' effectiveness and efficiency during their flood recovery process.

Exploratory research into an understudied area of the knowledge base required a unique approach. A review of the literature highlighted a research classification system appropriate for this study. Grossen (1996) identified theory building, theory testing, and evaluation as Type I, II, and III research, respectively. A three-level system for evaluating the evidence behind the statement "the research says" was summarized by Grossen (p. 22).

> Level I research is 'basic research' and theory building. Research at this level is comprised of correlations, descriptive data and qualitative case studies . . . . At Level II, a theory is tested . . . using statistics, researchers analyze the data to determine if the results are accidental or can be predicted to occur again . . . Level III research evaluates the effects . . . using large-scale implementations. Research at this level is important because it examines full context.

Grossen's three-level research classification system is shown in Table 3-1.

Table 3-1: Three-Level Research Classification System

Research Classification	Scientific Method
Level I. Theory building.	1. Develop a hypothesis.
Level II. Test the theory.	2. Test the hypothesis by formal experiment. 3. Analyze data to determine the truth of the hypothesis.
Level III. Replicate results in large scale studies.	4. Peer review, replication of the experiment, large-scale and/or long-term follow-up studies.

This study is intended to test the hypotheses formulated by existing literature. Therefore, this research has the characteristics of Level II research as defined in Grossen's model. The research questions and hypotheses will be introduced separately in Chapters V, VI, and VII.

Based on Grossen's model, the following research design was adopted. Purposeful samples from the population of GOs and FBOs were interviewed to gather qualitative data. Interviews were conducted to investigate GOs' and FBOs' perspectives on household recovery issues. A survey instrument was used to query householders for quantitative data. Participants were asked to share their insights into PDRP and their perceptions of GO and FBO effectiveness and efficiency. In addition to analyzing each population studied, comparisons between populations were conducted. The results will be discussed in Chapter VIII.

3.4 Summary

This case study explored Boulder County Colorado's recovery from the 2013 floods in the context of permanent housing recovery. Data from GOs, FBOs, and householders were gathered and analyzed. The study involved concurrent investigations into GOs and FBOs through questionnaires and interviews conducted during the second half of 2016.

This mixed methods research was designed to address a deficit in the knowledge base and to test hypotheses in this understudied area. Through pragmatic or mixed methods research, data were gathered from GOs, FBOs, and householders.

GO and FBO populations were identified from data, incident action plans, government reports, and contacts with organizations such as the Colorado Department of Emergency Management and Colorado Voluntary Organizations Active in Disaster (COVOAD). These organizations had knowledge of the entities involved in housing recovery following the floods. These populations were purposefully sampled using snowball sampling techniques. Interviews were requested in alignment with protocols approved by the OSU Institutional Review Board. Interviews were scrubbed of identifying elements and uploaded to qualitative data analysis software. Coding guides, derived from data-driven coding techniques, were developed and used to code data. Analysis of the coded data created the data set for GOs and FBOs.

Quantitative data were gathered from householders to address issues of effectiveness and efficiency of PDRP. The Boulder County building department provided a listing of all flood related permits, and the entire population was mailed questionnaires in a four wave model. These data were tallied and analyzed using the statistical package SPSS.

CHAPTER IV

METHODOLOGY

4.1 Pragmatic Research (Mixed Methods)

In this mixed methods study, quantitative and qualitative research techniques were blended to synergistically provide deeper insight into the PDRP process used by FBOs. The term *pragmatic research* is used to describe this blended methodology (Bloomberg & Volpe, 2008). In pragmatic research, the research is bolstered by gaining views from multiple vantage points, such as various levels within organizations and from external perspectives (Cronin, 2014).

This study focused on investigating the PDRP used by GOs and FBOs engaged in permanent housing recovery. The research asks whether NPS processes are present in PDRP for permanent housing recovery and, if so, to what extent. Finally, the research investigated whether planning processes are related to perceived efficiency and effectiveness of permanent housing recovery. Each of these topics was investigated in the context of the 2013 Boulder floods.

Three viewpoints were engaged to view PDRP from the perceptions of FBOs, GOs, and householders whose residences were impacted by the floods. Qualitative data were gathered from interviews of GOs and FBOs selected through purposeful sampling. Quantitative data were gathered from a survey of all Boulder County householders who permitted repairs or replacement of housing resulting from flood damage. Insights gained through inferential statistical analysis of quantitative householder data were compared with insights gathered from qualitative analysis of GO and FBO interview data. These comparisons built the foundation for

discussion of the research objectives from the three perspectives.

Nongovernmental organizations (NGOs), specifically FBOs, are often reported to be more effective and efficient than GOs in post-disaster settings. Research has shown that less formal systems can surpass strict command-and-control models in disaster response and recovery (Neal & Phillips, 1995; Scolobig et al., 2015). The absence of government bureaucracy and a strong personal commitment from individuals working with FBOs are also cited as reasons for the high level of FBO performance in disaster recovery (Lampkin & Raghavan, 2008).

The research objective of this study seeks to determine whether FBOs' PDRP is more effective and efficient in providing permanent housing recovery than the NPS. The dynamic nature of post-disaster conditions does not necessarily follow the expected conditions outlined in pre-disaster plans. The post-disaster recovery environment is usually more dynamic, chaotic, and complex than is typically foreshadowed in pre-disaster plans (Chang, Wilkinson, Brunsdon, et al., 2011).

4.2 Case Selection

This investigation uses the case study of housing recovery in Boulder County following the 2013 floods. Case study is an appropriate methodology for topics such as PDRP for which there is little existing research. This methodology is a valuable tool for forming theory based on one or a very few cases (Grossen, 1996; Seawright & Gerring, 2008). Furthermore, the literature review clearly shows that the PDRP process used by FBOs in permanent housing recovery is understudied.

The 2013 Colorado floods provided an opportunity to pursue the research objectives stated in Chapter III. The State of Colorado is located in the central United States of America

(Figure 4-1). During the 2013 Colorado floods, residents in 11 counties filed FEMA Individual and Housing Program (IHP) assistance applications (Table 4-1). Figure 4-2 provides a more detailed view of Boulder County watersheds involved in the 2013 floods. It shows that Boulder County is downstream from two major drainage basins, the St. Vrain Creek and Boulder Creek Watersheds.

The amount of IHP assistance provided in Boulder County was over three times as much as the county with the next highest number of IHP applications. Based on household flood response data, Wu et al. (2017), pointed out that Boulder County was one of the hardest hit counties by the 2013 Colorado Floods; their study asserted that Boulder County households were more likely to experience greater recovery needs and longer time frames to complete recovery projects.

Figure 4-1: Location of Boulder County Colorado.
Source: Colorado Geological Survey 2013.

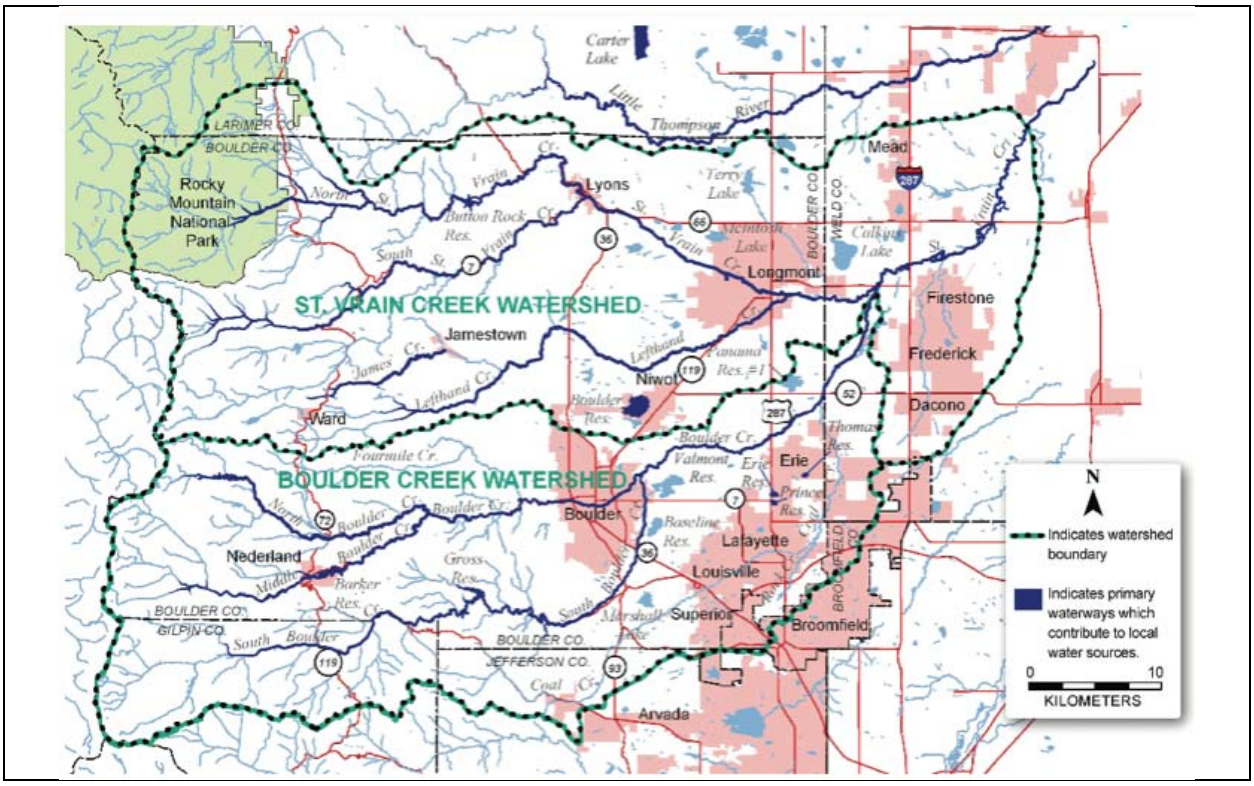

Figure 4-2: Boulder County Colorado Watershed Map.
Source: St. Vrain Center for Resource Conservation 2015.

Table 4-1: Individual and Housing Program Assistance

County	Applicants	IHP Amount
Adams	988	$1,251,366.87
Arapahoe	2,721	$3,580,836.79
Boulder	15,554	$35,307,807.47
Clear Creek	181	$246,784.23
El Paso	1,466	$1773,591.41
Fremont	101	$61,302.39
Jefferson	912	$1,599,530.57
Larimer	3,874	$6,991,351.23
Logan	311	$534,413.76
Morgan	56	$92,353.45
Weld	2,005	$10,189,307.98
Total	**28,169**	**$61,628,646.15**

Source: 2013 Colorado Floods Federal Assistance Fact Sheet (Federal Emergency Management Agency, 2014)

The nexus of an atypical disaster such as the 2013 floods and uninsured housing loss in the Colorado Front Range is unique. Much of the lost or damaged housing stock in the 2013 floods was uninsured. This 1,000-year flood impacted many homes outside the 100-year floodplain, and less than 10% of the homes impacted in Boulder County had flood insurance (Deniz, Arneson, Liel, Dashti, & Javernick-Will, 2017). The National Flood Insurance Program does not mandate flood insurance of homes outside a flood zone (Kousky, 2011). Thus, householders residing outside a flood zone usually do not carry flood insurance riders on their homeowner's policies because such coverage is optional and expensive. Secondary impacts from flooding, such as landslides or mudslides, are also excluded from coverage (Highfield, Norman, & Brody, 2013).

The State of Colorado Deputy Recovery Officer declared the 2013 Colorado floods to be the largest disaster in Colorado history (Gochis et al., 2015). The recovery officer recognized the importance of community recovery and directed that 100% of displaced households were to be out of temporary housing by December 1, 2013, less than 90 days after the disaster. Boulder County's Director of Housing and Human Services declared that the request for assistance exceeded funds available in Boulder County (Gochis et al., 2015).

The State of Colorado Flood Recovery Action Plan articulated the extreme impact to Boulder County, identifying it as the hardest hit county in the 11-county area. Over half the housing loss and Small Business Administration (SBA) loans were for people in Boulder County. Additionally, infrastructure was damaged at a rate two times higher than the county with the next most severe impact. Nearly 50% of all infrastructure damage from the floods occurred in Boulder County (Fedler, 2015). These reports clearly identify Boulder County as the epicenter for damage from the floods with a particularly high level of damage to housing.

Several GOs were involved in recovery after the floods. The Colorado National Guard dubbed their response effort to the Colorado 2013 Floods as *Centennial Raging Waters 2013.* The response was authorized by Governor Hickenlooper's Executive Orders D2013-026 and D2013-028. Brigadier General Byrne summarizes the scope of the disaster as follows:

> Impacted 24 of 64 Colorado counties, eight fatalities; 218 injuries; destroyed 1,882 homes and 200 commercial buildings; damaged 16,036 homes and 1,509 commercial buildings; affected over 200 oil wells; significant impact to critical infrastructure and key resources including power, water, and transportation. (Crow & Albright, 2014)

The 2013 floods resulted in uninsured loss at higher levels than Colorado WUI fires. More than 53 agencies and 275,484 volunteer hours were provided to assist in the six months following the floods (Federal Emergency Management Agency, 2014). Unmet needs continued as response transitioned to recovery, and many FBOs assisted with recovery (Crow & Albright, 2014). This disaster provided a promising case study for investigation. The need for FBO assistance was much greater than previously seen for Colorado wildfire disasters. Homes impacted by WUI fires are typically insured; whereas only 10% of the homes damaged and lost in the 2013 floods carried appropriate insurance (Gochis et al., 2015).

4.3 Qualitative Data Collection

For this research, official documents from the 2013 Colorado floods were gathered and reviewed to identify the population of GOs and FBOs. These populations were purposefully sampled to select individuals with knowledge of PDRP. Interviews were conducted between July and December 2016. These interviews were the qualitative data set for analysis.

The qualitative data were collected from interviews of individuals at GOs and FBOs involved in 2013 Colorado flood recovery activities. Since the research objective of this study is

to investigate GOs' and FBOs' perspectives on household recovery issues, the most effective way to study these issues was to sample information-rich individuals within these organizations. Thus, a purposeful sampling process was used to collect qualitative data from this population. The sampling process involves identifying individuals who were knowledgeable about the study topic or a given phenomenon (Crowe et al., 2011; Palinkas et al., 2015; Patton, 2002).

Purposeful sampling is appropriate for qualitative research; this approach included strategic selection of interviewees and validation by others in the setting. This methodology ensures that rich data, which might have been missed through random sampling, were included in the research. This practice supports a researcher cross-checking data through triangulation (Lofland, Snow, Anderson, & Lofland, 2006). Selecting individuals from various positions inside and outside of organizations supported triangulation and verification of data (Killian, 2002). The snowball technique is widely used in mixed methods and qualitative methods studies that utilize purposeful sampling. Snowball sampling is cited as particularly effective in disaster recovery. In training healthcare workers for disaster recovery roles, for example, Tower et al. (2016) used purposeful snowball sampling to measure perceptions of efficacy. Snowball sampling was also used by Dogulu, Karanci, and Ikizer (2016) in measuring perceptions of community resilience following disaster. It is well documented that snowball sampling has been effectively used in the social sciences for qualitative studies measuring perceptions.

With interviews being the fundamental component of this qualitative research, selecting the population and appropriate sample was of primary importance. Determining whom to interview in qualitative research is more complex than in a quantitative study (Labuschagne, 2003). Individuals from a cross-section of organizations and positions were interviewed for both GOs and FBOs. Though an interview guide was used, responsive interviewing techniques sought

deeper understanding of PDRP through maximum variation sampling, which included individuals with varied perceptions and points of view (Lofland et al., 2006).

Trust and rapport must be established for responsive interviews. This was accomplished by covering mundane and less sensitive material early in the interview (Lofland et al., 2006). An agile quantitative interviewer follows an interview guide and makes adjustments while gathering data. Open-ended interviews conducted with interview guides put participants at ease and facilitate participation in guided conversations (Phillips, 2014). The responsive interview was a key component in this qualitative research. Through purposeful sampling, developing relationships, interview structure, and awareness of ethical considerations, rich data were gathered.

Using formulas for determining statistical significance, a quantitative researcher knows precisely when sampling is complete. Quantitative researchers employ a specific tactic for determining completion; that is, interviews are concluded at a saturation point, a point of diminishing returns where little new is being added with each subsequent interview (Bowen, 2008; Glaser & Strauss, 1966). Both GO and FBO interviews were concluded when this researcher recognized saturation.

4.3.1 GO Sampling and Data Collection

The population of GOs assisting with housing recovery was compiled from reviews of governmental reports, internet searches, and inquiries directed to the lead agencies cited in these sources. Agencies participating at the federal, state, and local levels are described in this section.

At the federal level, Colorado Congressman Polis (Polis, 2013) provided disaster victims with a comprehensive list of federal resources to assist with housing recovery. The list included

FEMA, FEMA Disaster Recovery Centers, SBA, Office of Housing and Urban Development (HUD), and NFIP. This document provided a portion of the GO population considered for this study.

At the state level, a publication entitled *Denver UASI All-Hazards Regional Recovery Framework* (Hard, 2012) articulated state resources available to assist with housing recovery. The document identified the Colorado Department of Local Affairs, Division of Housing, Colorado Housing Finance Authority, and the Colorado Department of Human Services as organizations involved in housing recovery. Organizations identified from these sources were added to the population of GOs considered for the research.

At the county level, the Boulder Long-Term Flood Recovery Group provided information about the organizations involved. The Office of Emergency Management, Land Use Department, Boulder Flood Rebuilding & Permit Information Center, Department of Housing and Human Services, and the Boulder County Flood Recovery Center were the entities identified as providing long-term housing recovery assistance. These organizations were added to the research population to be sampled. Table 4-2 lists the GOs identified as providing permanent housing recovery support during the 2013 Boulder County Colorado floods. This list reflects the population of governmental entities for this research project.

Table 4-2: GOs Providing Permanent Housing Recovery Assistance

Federal Organizations
Federal Emergency Management Administration
Small Business Administration
National Flood Insurance Program
Housing and Urban Development
State of Colorado Organizations
Department of Local Affairs
Department of Emergency Management
Division of Housing
Colorado Housing Finance Authority
Department of Human Services
Boulder County Organizations
Long-Term Flood Recovery Group
Office of Emergency Management
Land Use Department
Building Department
Boulder County Flood Recovery Center
Flood Permitting and Permit Information Center
Department of Housing & Human Services

An internet search and telephone follow-up determined the individual(s) in each organization responsible for housing recovery operations in Boulder County. Contact information for individuals and organizations was collected from IAPs and internet searches. These individuals served as the primary point of contact for GOs; they were asked to identify others who might have information relevant to the research. These additional individuals were added to the population. Data for GOs and FBOs were gathered through responsive interview.

Semi-structured interviews were conducted in July through August of 2016. An interview guide, which was approved by the Oklahoma State University Institutional Review Board, provided structure and format for the interviews; the guide provided flexibility for exercising appreciative inquiry into the PDRP used by GOs and FBOs.

4.3.2 FBO Sampling and Data Collection

Faith-based organizations were also queried through interviews. For FBOs, the population of involved organizations was extracted from a single source, the COVOAD roster. The roster was analyzed, and organizations determined to be FBOs, as articulated in in Chapter VI of this dissertation, were selected as the population of FBOs for this study. Table 4-3 identifies the FBOs included in this study.

Table 4-3: COVOAD Listing of Agencies in Housing Recovery

American Red Cross
Calvary Relief
Colorado Baptist General Convention
Habitat for Humanity
Life Bridge Church – Longmont
Mennonite Disaster Services
Operation Blessing
Presbyterian Disaster Assistance
Samaritans Purse
Serve 6.8
Westwoods DiRT
World Renew

Source: Colorado VOAD Agencies Profile Matrix, 2013

Primary contacts and additional individuals suggested by these contacts comprise the sample of FBOs for the research. Contact information was collected using internet searches and document review. Several FBO contacts demonstrated a reluctance to participate in interviews and some mistrust of the motives for the study. After several FBO contacts resulted in declined interviews, this researcher investigated this paradigm and found many scholars have experienced a similar hesitancy from religious-based groups about participating in research (Murphy, 2016; Sherkat, 2007).

Interviews were conducted in July through December 2016. Interviews lasted 40-90 minutes and were professionally transcribed. Approval for transcription services was secured from the Institutional Review Board, and a confidentiality agreement was executed between the

researcher and the transcriptionist. Copies of transcriptions were provided to the interviewees for review and corrections if necessary. Of the transcriptions provided, only two interviewees offered corrections, and these were minor and primarily grammatical in nature.

4.5 Quantitative Data Collection (Household Survey)

Quantitative data were gathered from householders to address Research Objective 2, the perceived effectiveness and efficiency of GO and FBO PDRP. The Boulder County Building Department was queried for householder contact information. The department tagged all FRPs in their citizen access records management system with the metatag "FRP." This facilitated the export of data, including permit applicant, scope of work, permit address, and mailing address. The administrator of the Boulder County Records Management System assisted by generating a Microsoft Excel File export for all FRPs. This file, which included associated descriptive data fields, defined the population of householders for the study.

In November and December 2016, a paper questionnaire was developed and sent to the mailing addresses for householders impacted by the floods. The surveys contained 42 questions: 40 questions with forced-choice responses and two items requesting open-ended written responses. A delivery protocol, described by Dillman (2007) as the four-wave mail survey process, was used for the mailings. The first wave of mailing, which included a cover letter, informed consent document, questionnaire, and a stamped return envelope, was sent on November 18, 2016. A postcard reminder to complete the survey was mailed on December 2, 2016. Two additional mailings of all documents included in the first wave were mailed on December 9, 2016 and December 16, 2016.

Forty-two mailed items were returned marked "undeliverable" or "unable to forward." Subtracting these from the original dataset of 307 created a population of 265 (N=265).

Ultimately, 80 surveys were returned for a response rate of 30%.

4.6 Ethical Considerations

Safeguards were taken to protect the rights of participants. Specific safeguards included use of the Oklahoma State University Institutional Review Board's approval, participants' informed consent, and interviewee validation of interview transcripts. Participation was voluntary and un-coerced. Participants were provided the latitude to opt out of the research at any time. Similarly, unique identifiers were scrubbed from data to protect anonymity.

The researcher heeded the advice of qualitative researchers discussed in the review of literature. Data that might discredit or cast a negative light on a specific GO or FBO was handled delicately, and specific references to individuals or organizations were scrubbed from the data before analysis. The aggregate reporting of data prevented any GO or FBO from being singled out. (Phillips, 1997).

The ethical considerations in qualitative studies cannot be underestimated. The American Sociological Association's code of ethics discusses the duty of ethical researchers to protect the confidentiality rights of participants even when researchers are not legally mandated to provide this protection (Erlandson, 1993; Gorden, 1998; Iutcovich, Kennedy, & Levine, 2003; Phillips, 1997).

4.7 Summary

In summary, the bounded case study of Boulder County Colorado following the floods of 2013 is the crucible chosen for investigating the PDRP process. Colorado's disaster experience and subsequent housing recovery paradigm is typically a response to wildfires. In the 2013

floods, described as the state's largest disaster, significant housing stock was lost. As much as 90% of the loss was uninsured; this loss created a greater need for permanent housing recovery assistance. In large part, this need was filled by FBOs. This atypical disaster brought many FBOs to Colorado and provided a unique opportunity for studying GO and FBO PDRP.

A mixed methods research agenda was selected for the project for deliberate reasons. Neither quantitative nor qualitative measures alone would have been adequate. Numbers alone would not yield the rich data desired by this researcher. Similarly, questions and interviews would not have been inclusive enough to tell the entire story. For this research agenda, three populations–GOs, FBOs, and householders permitting repair or replacement of flood damage to residences–were queried using quantitative and qualitative research methods.

The research population for each of these groups was determined systematically. GOs were identified through analysis of documents describing organizations assisting in permanent housing recovery at the federal, state, and county level. FBOs were identified from NGO documentation provided by COVOAD. The population of householders was identified with assistance from Boulder County as those who received FRPs for residential construction.

Purposeful snowball sampling techniques were utilized to identify individuals to participate in interviews. Interviews were conducted between July and December 2016. Data were aquired through coding and analysis of responsive interviews. Quantitative inferential statistical analysis was conducted on householder responses.

These mixed methods complemented each other and provided insights quantitative or qualitative research could not have provided alone. Quantitative data analysis provided measures of householders' perceptions about structure level, effectiveness, and efficiency of PDRP. Comparing and contrasting householders' perception with qualitative data gathered through GO

and FBO interview provided deeper insight into PDRP. This synergistic research agenda was more powerful than either research method would have been if used alone.

CHAPTER V

BOULDER COUNTY GOVERNMENT'S ROLE IN THE NDRF

5.1 Summary of Local Government's Role in Permanent Housing Recovery

The NDRF outlines the general context of responsibility for local government in housing recovery from the federal perspective. The framework suggests redevelopment of housing requires information sharing between federal, state, and local entities (Federal Emergency Management Agency, 2016). Additionally, the framework outlines two key NPS elements of access to effective communication processes and GO program information.

The NDRF provides PDRP guidance for local government in three distinct categories: strategic (driven by policy), operational (coordination), and tactical (managing projects and resources) (Federal Emergency Management Agency, 2016). Relating specifically to post-disaster planning, the expected core capabilities of county government were identified. The NRDF directs the county to "conduct a systematic process engaging the whole community as appropriate in the development of executable strategic, operational, and/or tactical-level approaches to meet defined objectives" (Federal Emergency Management Agency, 2016, p. 25).

Boulder County responded to these federal mandates by articulating recovery efforts in a Project Charter issued October 31, 2013, less than 45 days after the flood. This charter identified

guiding principles, mission, management structure, and outcome measures (Boulder County, 2013). Two GOs were designated to guide recovery at the county level: the Flood Recovery Policy Group and the Flood Recovery Leadership Group. Both groups were created as a result of the Charter. The charter was developed for, and approved by, the Boulder County Commissioners. These groups were to be closely aligned and essentially share the policy and leadership of recovery. The intent was to define complementary missions, not oversight of one group by the other. The policy group was charged with setting policy, essentially translating the wishes of the county commissioners into the parameters outlining recovery activities. The responsibilities of the policy group were to:

- Lead development of the community's recovery plans.
- Make high-level business decisions for stabilization and recovery projects.
- Execute County Commissioner directives.
- Identify and report program level issues pertaining to projects.
- Advise on changes to scope, schedule, budget, policy, and regulatory action.
- Resolve strategic policy and project issues escalated by project teams.
- Communicate with key stakeholders.

The leadership group was charged with leading the efforts—essentially inspiring and overseeing those charged with carrying out recovery according to policy. This group divided responsibility into three distinct areas of responsibility: (a) intergovernmental relations, (b) flood stabilization and recovery management, and (c) community engagement. The responsibilities for this group were:

- Communicate recovery priorities to state and federal governments.

- Communicate recovery priorities to recovery stakeholders.
- Support stakeholders and community with overall strategic guidance.
- Support stakeholders and community with decision-making and issue resolution.

Boulder County recovery efforts for flood-related residential damage was supported by field offices, termed FRCs. These community resources assisted impacted householders with navigating the regulatory aspects of permanent housing recovery. The FRCs included land use, planning, environmental, and building officials having jurisdiction in unincorporated Boulder County. In an FRC, householders had access to a variety of resources in a single location, thus improving integration of Boulder County assistance to householders. The FRCs were created with the intent of increasing both the effectiveness and efficiency for householder assistance.

5.2 Research Questions

In Chapter III, research objectives were introduced for GO PDRP. The first objective sought to determine if NPS elements existed in GO PDRP; the second research objective sought to measure the effectiveness and efficiency of PDRP. The literature showed that the strict command and control existed in GOs' response following disaster (Neal & Phillips, 1995; Zhang & Peacock, 2010). It was suggested that the formality of planning and organization decreased with the passage of time in the response phase (Kates et al., 2006; Olshansky & Johnson, 2014).

In this recovery, the 2010 draft of the NDRF and the *Boulder County Flood Recovery Charter* (Boulder County, 2013) articulated systems with NPS structure to guide overall recovery. However, the method by which this guidance was translated into field operations was unclear; that is, how formal were the NPS processes in GO PDRP?

A quantitative approach was not feasible for this study because the GO sample size did not provide enough statistical power to conduct a meaningful inferential statistical analysis. Therefore, interviews were used to address the research objective relating to NPS elements in GO PDRP and GOs' perceived flood recovery effectiveness and efficiency. Two research questions (RQ) were stated:

GO-RQ1: Do GO PDRP follow the formal structured processes outlined in the NPS?

GO-RQ2: Do GO personnel see the PDRP used by GOs as highly effective and efficient?

5.3 Coding Procedures

Interviews were conducted by the researcher and transcribed by a professional transcriptionist. The use of a transcriptionist required approval from the Oklahoma State University Institutional Review Board. The researcher received consent from study participants to record phone and in-person interviews, using a digital voice recorder to capture audio files. These files were shared with the transcriptionist who returned a draft of the interviews in a Microsoft Word format. The Word documents were then shared with interviewees who were allowed to make corrections, deletions, or additions. Only minor grammatical corrections were made during this review process. The transcriptionist executed a confidentiality agreement with the researcher, agreeing to destroy or return all audio and written records of the interviews upon completion of the transcriptions.

Interview data were then scrubbed of identifying information. In the interviews, any identifying reference to the individual such as their name or unique identifiable position was replaced with *[Individual]*. Similarly, any reference to the organization the interviewee

represented was replaced with the term *[Organization]*. Once scrubbed of this information, interview transcripts were uploaded to qualitative data analysis software.

The qualitative data analysis software program selected to assist with qualitative data analysis is *NVivo*. This software was selected primarily because of its wide use and acceptance in the social sciences (Silver & Woolf, 2015; Silver & Lewins, 2014). NVivo, Version 11.4.0 software, produced by QSR International, allowed data to be coded, sorted, and analyzed. NVivo was simply a tool to assist the researcher with the technical aspects of coding and organizing data. The coding guide was developed in conjunction with data-driven coding as described by DeCuir-Gunby, Marshall, and McCulloch (2011).

The first step in coding was to develop the data-driven codes. These codes were distilled from the research questions (RQ) by reviewing all GO interviews and searching for recurring concepts and thematic elements. Using this process, the researcher created a structure for the initial coding and used NVivo as the tool for organizing and tracking coding. The researcher assigned and interpreted the codes, using the coding guide shown in Table 5-1.

Table 5-1: GO Codes for Qualitative Data Analysis

Code	Description	Example
Codes	Land use, planning, building codes – such as county requirements, International Building and Fire Codes (IBC, IFC).	"We had to rebuild to the 2012 Building Code."
Cooperation	Cooperation between GOs, FBOs, citizens. Each is a sub code.	"We worked with FEMA to complete damage assessments."
Effective	Comments referencing the effectiveness of a person, process, entity, etc.	"The meetings were effective and outlined a plan to get an SBA loan."
Efficient	Comments referencing the efficiency of a person, process, entity, etc.	"The briefing followed a standard structure each day; we got the information we needed within 10 minutes."
GO PDRP	Comments referring to GOs post-disaster recovery planning – the field side of planning, not a pre-disaster plan, rather what really occurred during recovery.	"The County conducted meetings for the town every Monday. This was a time the plan was set into motion for coordinating inspections for several housing recovery projects at once."

The second step in coding was to review and revise the coding in context. This step is sometime referred to as *axial coding* (Corbin & Morse, 2003; Seidel & Urquhart, 2013). At this phase of coding, code labels and definitions were determined. The final step in developing data-driven codes was to determine reliability; this was done by revisiting the coding and addressing variations in interpretation or application. Once any discrepancies were reconciled, a final coding scheme was developed and applied to the interviews. The data were coded many times in this process (Glaser & Strauss, 1966).

Six interviews with GO personnel were conducted in July through November of 2016. These interviews were professionally transcribed and coded by the researcher using the coding guide. *NVivo* qualitative data analysis software was used to facilitate the coding and analysis processes. Coding and analysis were completed in February 2017.

5.4 Results

The numbers of references to the coded items in GO interviews are listed in Table 5-2.

Table 5-2: GO Responses to Coded Interview Items

Code	Total Number of Responses	Number of Responses
Codes (Building, Planning Codes)	7	
GO PDRP	38	
Communications		8
Previous Experience		4
Structured		24
Unstructured		2
Cooperation	36	
FBO Cooperation		4
FBO-GO Cooperation		26
FBO-GO Non-Cooperation		6
Effectiveness	18	
GO-PDRP Effective		11
GO-PDRP Ineffective		7
Efficiency	7	
GO-PDRP Efficient		4
GO-PDRP Inefficient		3

Table 5-2 identifies the interview transcriptions relating to GO-RQ1 and GO-RQ2. The results show GO-RQ1 was supported by the data, and GO-RQ2 was partially supported by the data. The details are discussed below.

5.4.1 Structures During Housing Recovery

The interview data supported GO-Research Question 1. Formal structures described in the NDRF were present in the PDRP of GOs involved in housing recovery in this case study. The structure of the processes in place was further amplified by the governmental structure imposed by the International Building and Fire Codes used in the rebuilding process. Structure is prevalent in land use policy and building codes. A flood recovery manager stated, “staff are used to problems, codes, and regulations.” Table 5-2 shows references to building, planning, and zoning codes by GO personnel (n = 7). The most strongly worded preference for deliberate and rigid NPS structure was, “A well-orchestrated, well-articulated recovery plan is much easier to execute than an ad hoc, or pick-up type of recovery plan.”

Examples of the county allowing rebuilding of non-conforming structures were reported in the data. However, the county was very direct and deliberate in not allowing rebuilding in hazard areas and requiring major reconstruction to meet current codes. Buyouts were offered to 48 residents to prevent rebuilding in hazardous locations. The county appeared to be the clearinghouse for navigating the process for homeowners.

Recovery models, as suggested by Comerio (1998), were present in the data. The concept that housing recovery following a U.S. disaster is accomplished through capital infusion and limited intervention was supported by the qualitative data gathered in this research. Multiple references to GO structure (n = 24) are shown in Table 5-2. The majority of these comments refer to guidance rather than oversight.

More prevalent were discussions of limited intervention. Typical of these comments was the statement, “We just could not have ever imagined this type of scale . . . it’s more about

setting up roles, and responsibilities, and policies." Another GO employee stated, "It is a collaborative relationship based on a value proposition, the needs of the parties involved, and the capabilities of those parties." Referring to limited government intervention empowering others, a state employee said, "What we need to do is engage the whole community, and we need to determine actual, rather than perceived needs. We need to empower everyone in the community, and we need to support and strengthen what works."

Recovery in Boulder County appeared to focus more on capital-infusion and limited-intervention models than a market approach. This was expected from the literature review. A county official stated the importance of "finding resources, whether that was through the state, federal, or other flood recovery fund sources."

GO personnel in this study articulated the importance of structure in the GO process. A state employee observed, "It helps us to identify strategic objectives, outlines the support functions that will be needed . . . that helps us to facilitate and support the financial and logistics side of the recovery." A county official concurred, saying structure allowed "staff to collaborate with providing that person a roadmap for their recovery."

Some comments suggested a less stringent application of codes in this post-disaster setting (n = 2). Statements about relaxing the protocol were cited by a GO official in the building department, who stated: "[FBOs] didn't necessarily have to be licensed contractors because they weren't really getting paid for what they were doing, so we allowed them to work without being licensed." Some rebuilt homes did not comply with current land use regulations. One GO official observed, "We did have allowances for non-conforming structures, both in terms of uses and

setbacks, and the structures themselves. So, it is possible that non-conforming uses were allowed to rebuild."

Conversely, other owners had to improve the buildings to current standards. A Boulder County Building Department employee spoke of imposing more stringent, current code requirements when rebuilding: "We did require people to meet the current building codes when they rebuilt, which included fire sprinklers if they were basically building a new house, or energy efficiency requirements."

PDRP structure was suggested as beneficial in that "It helps us to identify strategic objectives, outlines the support functions that will be needed . . . and probably most importantly, it gives us a broad-brush timeframe for completing these recovery efforts. That helps us to facilitate the financial and logistics side of the recovery." A GO respondent articulated the preference for NPS structure in GO PDRP: "Well, it all comes down to processes and protocols."

Details about structure and ties to the NPS were stated often by GO personnel (n = 36). One state official discussed the assessment processes outlined in the NPS by saying, "We use mission scoping assessments, or MSAs; this is an early picture or quick snapshot in each RSF [Recovery Support Function] of the current and anticipated impacts of the disaster. We identify recovery issues, and then we look at those items that may hinder or help an effective recovery." When asked how the recovery work was parsed out to GOs, the reply was, "We use recovery support functions." There were, however, comments contrary to the belief that all NPS structure supported success in housing recovery. For example, one FEMA employee expressed concern about GO bureaucracy for householders stating, "I believe the work order system could be far more effective. Much less bureaucratic and much closer to the field."

At the county level, much discussion of PDRP addressed process rather than detailed direction. This was typified in the statement, “We had a recovery plan, but it was more about structure and process . . . it’s more about setting up roles, and responsibilities, processes, and policies.” The concept of a guiding document at the county level was also discussed. “We did adopt a charter for this flood, roles, responsibilities, and some goals.”

The frequency of community meetings was reported to taper off as time passed. One official stated, “Early on it was monthly, and then it would shift to quarterly.” In comparing PDRP early and late in recovery, a federal employee said, “It’s a much slower process; it’s a much more deliberate process. The planning cycles are much longer. Even though we have daily benchmarks, there is typically a seven-day planning cycle. So, rather than having planning sessions twice a day . . . the planning meetings and the Planning P are executed only once during a week.”

The literature frequently cited difficulty navigating government programs as an impediment to permanent housing recovery, and vulnerable populations were said to have greater difficulties with governmental processes. This was supported by the data. For example, “A lot of them have been there a long time . . . so 50 plus [years old] for sure. I mean the millennials either are living in the cities, or they haven’t bought.” Vulnerability in the case of the Boulder floods is primarily age. GO respondents stated that older adults, with inadequate or no insurance, were most severely impacted and constituted the most vulnerable population.

5.4.2 GOs’ Role in Housing Recovery—Perceptions of Effectiveness and Efficiency

The interview data supported GO-Research Question 2. GO personnel saw the PDRP used by GOs as highly effective and efficient. GO personnel’s perceptions of GO effectiveness

and efficiency were largely positive. Comments referencing effectiveness and efficiency of community informational meetings were common (n = 41). Location of and advertisement for community meetings were often cited in the data. The following is characteristic of GO respondents' statements regarding meetings: "Meetings are scheduled at regular intervals, notices go out through the internet, through our community partners, through social media, through local radio and TV. We typically try to use community centers, churches, some of those locations in the community that are well known."

Transitioning meetings to a smaller scale and making them more convenient for citizens was cited as a GO priority. One county official stated, "We had meetings in those neighborhoods, rather than having one big meeting with the county. We tried to get everyone to come down, we went to them, we went to where the people were. So, we went to their neighborhoods, which were rec centers, fire stations, community centers, or whatever they could come up with in their neighborhoods. Sometimes people's homes."

An underlying theme found from the GO perspective during the Boulder County housing recovery was the importance of cooperation. GO personnel cited cooperation as a key element responsible for their reported highly effective and efficient housing recovery. Cooperation between GOs and FBOs was cited often (n = 26) as shown in Table 5-2. Many more (n = 30) positive statements were made than negative ones noting non-cooperation (n = 6). One GO respondent summarized the importance of having a final goal by stating, "All of these [organizations] working together can increase our operational and recovery sustainability."

Communication from GO officials was reported to be effective and efficient; these data included respondents' perception of GO communication with citizens and FBOs. The importance

of effective intra-GO communication is evident in the statement, “The other thing it requires is effective and continuous communication. We need to establish that prior to an emergency, and we need to maintain that throughout the emergency . . . or in cases of recovery, which I believe your research is studying.”

Methods of communication with citizens included websites, printed resource guides, and community meetings. Much of the discussion at the county level focused on structure and finding “that gatekeeper person who would then distribute it to the rest of the community.” This person became the local public information officer. GO officials described leveraging this person: “I would send the information through that person, and that person would disseminate it to their neighborhoods where there was a Yahoo group, a Google group or LISTSERV, or whatever they did.”

Public information officers were the point persons for relaying information back to the county. In reference to these community liaisons, one GO respondent stated, “I relied on them to then also come back to me whenever there were concerns or issues. They helped kind of guide me on how to best work with each of the neighborhoods.” This is an example of two-way communication between GOs and homeowners being supported by a personal relationship developed from a GO process.

A GO preference for direct communication with individuals rather than broadcasting communication with an FBO or group of FBOs was stated. One GO respondent described improving communications by making personal connections by saying, “I answered, and began to correspond (with the individual) on the phone and by email.”

Challenges related to communications between GOs and FBOs were cited, not in terms of methods, but in terms of content. One GO respondent summarized the entire interaction between GOs and FBOs: “It all comes down to communication challenges. We all speak different languages, use different protocols, and produce different messages. We have mismatches in our resources, and our experiences.” They summarized the core problem as, “We have difficulty sharing.”

One GO official described the importance of collaborating and the power of diversity among entities involved in recovery. This respondent said, “When talking about public private partnerships, public entities do some things incredibly well, faith-based organizations do others, and private sectors do even others.”

Cooperation went as far as a GO inviting FBOs to participate in a GO entity, an FRC. A GO official noted, “There were a lot of faith-based groups participating in that center.” The message was spread by community meetings in which citizens were referred to “the Long-Term Flood Recovery Group, which was the clearinghouse for all outside NGOs and FBOs.” FBOs were invited to, and served on, government committees. One GO official reported, “The faith-based organizations, some of them were on the funding committee for the Long-Term Flood Recovery Group.”

The FRC case managers appeared to be key in connecting FBOs and GOs. A GO director stated, “I know the case managers did work with some faith-based organizations.” Caseworkers were considered the connective tissue between citizens and recovery: “They seemed to be the clearinghouse that helped everyone up there [in the FRC].”

Effectiveness and efficiency require cooperation. Data suggested Boulder welcomed the cooperation cultivated by the GO community. As one GO respondent stated, “It is a collaborative relationship based on a value proposition, the needs of the parties involved, and the capabilities of those parties. In this case, those parties would be the governmental and nongovernmental organizations.” Concerning cooperation at the municipal level, specific towns and FBOs were identified in the comment, “I know some places like Jamestown had a real tight relationship, I think with the Mennonites, and other groups.” The entire cooperation paradigm between FBOs and GOs was summarized in the comment, “It’s really not that complicated. What it boils down to is cooperation and communication.”

There were comments that cast a less positive light on the cooperation between FBOs and GOs (n = 6), as reported in Table 5-2. A GO official acknowledged that “It’s pretty much a necessary evil that there’s cooperation.” Differences in viewpoint and priority between the groups were seen in statements such as this, “So everyone sees the world, and their solutions, in their own experience. Emergency managers could frame everything on response experience. Faith-based organizations may . . . frame their thinking in recovery.”

Some GO personnel cited the differences between GOs and FBOs as significant. A GO official stated, “The challenges are [that] there are typically different cultures and operating styles. There’s different metrics and different value propositions.” The pitfalls of non-cooperation were summed up by saying, “Lack of a strong partnership can lead to some poor solutions.” More specifically, the lack of information sharing is cited as a weakness when one GO respondent described a perceived perspective on FBOs by saying, “So, they’re out there building plans in a vacuum, when actually much of the groundwork is already done.”

GO respondents cited the perceived effectiveness of GO PDRP more often (n = 11) than ineffectiveness (n = 7). These data are in Table 5-2. Each of the comments of effectiveness related back to the formal NPS structures that existed in GO processes. As one GO official described the situation, “jurisdiction would require, and did require enhanced federal, state, and local support. We look at those wider, overarching, multi-sector recovery issues, and then we look for opportunities for improving sustainability and resiliency . . . for basically building back better.” The attitude that the GOs were in the best position to determine resource allocation was summed up in the statement, “We also look at specific jurisdictions to decide who needs greater support.”

Leveraging relationships between GOs was cited several times as an avenue to improve effectiveness (n = 7). A county recovery official stated, “We had a really good relationship with OEM [Office of Emergency Management]. I know some OEMs wanted to keep hold of that [housing recovery], and some were not even involved at all. But we felt it worked well with us to collaborate.”

GO officials perceived the guidance they provided to citizens as highly effective. This statement is typical of this perception: “They worked with helping people navigate the process, and rebuilding, but also finding resources, whether it was through state, federal, or other local flood recovery fund sources.”

Several GO respondents reported proposed rebuilding in hazard locations as a major challenge. One GO official stated, “Our land use department is really the key annex that does that [i.e., identifies hazardous areas] for emergency management, so we definitely leaned on them.” A building official said, “Our disaster recovery regs [regulations] gave people a certain

amount of time, even if they were non-conforming to rebuild, if they build more or less the same type and in the same location, unless it was a hazard location."

In reference to a mismatch between householder intentions and limitations imposed by hazard zone regulations, one official observed, "Of course, when the people came back they wanted to put the garage exactly back in the same place it was, and that was our hazard mitigation review process to try to avoid that."

A buyout program was set in place to prevent rebuilding in hazard zones. This buyout program worked across several government programs. A recovery manager put the number of buyouts (in which a citizen was compensated and not allowed to rebuild in a hazard zone) at 48 residences in unincorporated Boulder County following the floods. According to this recovery manager, buyouts included, "19 hazard mitigation grant programs through FEMA and then 29 through the CDBG [Community Development Block Grant]. We're not done with this, but we're close, we still have probably a dozen, or 10 to go."

Table 5-2 shows that previous disaster recovery experience was occasionally cited (n = 4) by GO respondents. In each case, the previous experience cited was a Colorado wildfire. Referring to communication systems built on previous experience, one county official cited a relationship established at the Four Mile Canyon Fire, a wildfire that occurred in Boulder County in 2010. The respondent stated, "I had relationships with a lot of folks already. So, when the floods happened, I basically reached out to my contacts in the mountains in the different canyons." Learning from previous disasters was summed up by saying, "We can take a look at what went well in the last disaster, and take those lessons learned, and apply them to the next disaster."

5.5 Discussion

The data aligned with the literature in many aspects, but differed in others. Literature specific to GO PDRP is not plentiful; however, limited discussions about the presence of NPS elements in GO planning exist. Generally, the literature identified a spectrum for PDRP, with NPS at one extreme and loosely structured planning processes on the other. Structure was reported to support success. This finding was in contrast with the view that less structured, or loosely coupled organizational structures (typical of NGOs) outperformed the strict planning suggested by the NPS. One item of clear alignment between the literature and data was that NPS systems extended from response into the PDRP phase.

An area not clearly addressed in the literature is perceptions of effectiveness and efficiency. The literature suggested structured planning was used in GO PDRP; however, little is written about both the perceived and reported PDRP effectiveness and efficiency of GO processes. In this study, data measured perceptions, and positive perceptions of effectiveness and efficiency far outnumbered negative ones.

5.5.1 GO Structure

The importance of housing recovery in overall community recovery was cited in the literature. This key element of recovery was cited as much more than simply the replacement of buildings. Housing recovery was considered integral to community recovery (Comerio, 1998; Gotham & Campanella, 2011; Peacock, Van Zandt, Zhang, & Highfield, 2014). Statements from GO personnel support this. The statement, “It’s fundamental to the recovery process . . . [community recovery] is a problem-solving platform that integrates, organizes . . . with stabilizing housing stock” is typical of thoughts addressing the importance of housing in a

community's recovery. Data suggested that GOs officials at the county, state, and federal levels acknowledged the importance of housing recovery in the recovery of Boulder County.

A link between structured planning processes and success of permanent housing recovery efforts was found often in the literature (Oliver-Smith, 1990; Tas, M., Tas, N. & Cosgun, 2010). The NDRF (2016) divides PDRP into strategic, operational, and tactical levels. Data suggested Boulder County met these mandates with a multi-pronged approach and structure. The structure articulated in the NPS existed. The Boulder Flood Recovery Plan Charter (Boulder County, 2013) created a group to set policy (the Flood Recovery Policy Group) and a group to meet operational oversight (the Flood Leadership Group). FRCs were established in the cities of Longmont and Boulder to serve as tactical-level entities.

Overarching recovery objectives were determined to guide strategic, operational, and tactical levels. The Flood Recovery Policy Group and the Flood Recovery Leadership Group worked together to first set, then achieve, the objectives. These objectives included upward communication of recovery priorities to state and federal government entities as well as oversight to "resolve strategic policy and project issues escalated by project teams." These data, which supported communication strategies suggested by the NPS, were prevalent in GO PDRP.

For Boulder County, the Flood Recovery Plan Charter appeared to guide delineation of responsibility as well as overall recovery. Previous disaster experience, particularly the Four Mile Canyon fire, was the impetus to outline roles and responsibilities in the charter. The county building official referred to the Flood Recovery Manager's previous experience by stating, "He was our Four Mile Fire recovery manager before that, so he's up on disasters for sure."

Another element of NPS seen in GO PDRP were Mission Scoping Assessments, which described work within recovery support functions that were outlined. The importance of having and following "a well-articulated recovery plan" was repeated by many GO personnel. In the words of one GO official, "It all comes down to processes and protocols." These data also suggested NPS protocols were prevalent in Boulder County PDRP following the floods of 2013.

Comerio (1998) suggested four models are present when government is involved in housing recovery: redevelopment, capital-infusion, limited-intervention, and market models. Though the literature suggested GO PDRP processes for housing recovery in the U.S. are structured, government does not completely oversee housing recovery. Rather than having redevelopment directed and funded at the federal level, U.S. disaster recovery follows a model that relies on capital infusion or infusion of aid with limited intervention (Chang, Wilkinson, Brunsdon, et al., 2011; Comerio, 1998). However, some researchers believe U.S. intervention is actually more hands-off, pushing recovery toward the market model (Bolin & Stanford, 1998; Zhang & Peacock, 2010).

Data from the Boulder County housing recovery experience aligned with the capital-infusion and limited-intervention models. Many comments characterized the roles of federal, state, and county systems as being more about guidance than strict oversight. A county official described the need to be very deliberate in defining these roles, "Part of that was not negotiating, but being really clear with the director . . . what our roles were." A previous comment spoke to the limited intervention of GO in Boulder County housing recovery: "We had a recovery plan, but it was more about structure and process . . . it's more about setting up roles, and responsibilities, processes, and policies,".

There were few comments from GOs (n = 2) discussing the lack of structure in PDRP. One stated that with "informal planning process, not a lot of direct tasking came out of that." A second statement discussed the sometimes relaxed structure in the FRC: "They [participating organizations] walked in here kind of willy-nilly."

Excessive structure can slow recovery. Studies have shown that housing recovery can be a slow process (Marshall, 2014; Moss, Schellhamer, & Berman, 2009; Olshansky & Johnson, 2014). It is reported that this aspect of community recovery can take up to 10 years to complete (Federal Emergency Management Agency, 2016). The data suggest this was the case for some in Boulder County's housing recovery. The Flood Recovery Manager stated that three years post-disaster, housing recovery was far from complete. Though they envisioned the FRCs will be closed in 2017, this does not mark completion of housing recovery. A county official assessed overall progress by saying, "Three years. I think we're halfway through when it won't be a major focus for [the] county." A GO official stated, "The financial people will be at this for decades." Other comments referencing the slowness of housing recovery acknowledged "We do get some feedback that it is a slow and lumbering process."

The data demonstrated the need for FBO intervention to assist with recovery. In reference to supplementing GO assistance, one GO respondent described the practice of FBOs participating financially in funding community recovery saying, "I know they would pull money from their own church accounts."

The literature suggested that GO personnel were often ill-prepared to assist citizens when they needed it most (E. L. Quarantelli, 1982). GO data suggested this was not the case in this recovery. Data showed GOs were critical in their analysis of federal and state programs: "A lot

of times it felt like they didn't have an idea, or [desired] state, so we ended up making a lot of it as we went along." Concerning assistance from federal GOs, a local GO official stated, "They weren't well-equipped; they didn't understand our setting." This description for the perceived ill-preparedness of GOs to assist was dwarfed by another respondent's view that "They had no idea what they were doing."

5.5.2 GOs' Effectiveness and Efficiency

The NPS structure was considered a primary reason for the effectiveness and efficiency of GO personnel. This observation was included in positive comments coded as cooperation, effectiveness, and efficiency (n = 45), compared to negative comments (n = 16). Examples of the former included statements from other GOs such as, "We had a really good relationship with OEM [Office of Emergency Management]." A majority of the data suggested GO personnel perceived the FRCs as highly effective and efficient.

GOs also believed strongly that their work with the public was highly effective and efficient. FRCs, caseworkers, and GOs "worked with helping people navigate the process, and rebuilding, but also finding resources." The vehicle most discussed for its effectiveness and efficiency of execution were the FRCs. Two FRCs set up by the county, one in Boulder and the other in Longmont. At these facilities, homeowners could meet with the myriad of GOs involved in recovery and gain insights into permitting and hazard mitigation review processes, as well as resource availability.

As one county official explained, "Rather than them having them go to multiple different buildings to get their questions answered, they could come to one place." There were also comments about cooperation with FBOs described as being, "A collaborative relationship based

on a value proposition." County personnel staffed FRCs, and it appears case managers directed the primary guidance through the recovery process. The statement, "I'm still working with Catholic Charities, for instance, on helping someone," supported the perception that case managers supported highly effective and efficient PDRP.

The primary initial method of efficient and effective communication between GOs and householders is noted as being the community meeting. These meetings were also used at the neighborhood level and were cited as a primary driver of effectiveness and efficiency. Additionally, the internet, email, and LISTSERVS were utilized for communication. GO officials also cited the use of neighborhood representatives as key drivers of efficiency and effectiveness. It was suggested that many neighborhood public information officers were contacts established in previous disasters, namely the Four Mile Canyon Fire.

The literature suggested government involvement decreases as disaster recovery evolves. In accord with the literature, the frequency of community meetings decreased over time. Recovery is seen in the literature as a collision of a time where citizens need more help and a disengaging government does not provide it (Bolin & Stanford, 1998; Oliver-Smith, 1990). Data were aligned with this literature. The County Flood Recovery Manager stated, "Early on it was monthly, and then it would shift to quarterly."

There were comments that mentioned communication problems. Poor communication between GOs, FBOs, and citizens was cited as an obstacle to effectiveness and efficiency. These included challenges at the core elements of language, protocol, and messages. The most telling statement had to do with a feeling of protectionism on both sides of the communication: "We

have difficulty sharing." Another GO respondent described this cooperation as "a necessary evil" and suggested that non-cooperation leads to "poor solutions."

Despite communication challenges, cooperation between GOs and FBOs was reported frequently. Statements about GO-FBO cooperation (n = 26) were made over four times as often as statements about non-cooperation (n = 6), as shown in Table 5-2. GOs acknowledged some things were handled better by FBOs, others by the private sector, and still others are best left to GOs. This openness to cooperation and connection is a key finding in support of the effectiveness and efficiency of GO PDRP.

CHAPTER VI

FBOs AND PERMANENT HOUSING RECOVERY

6.1 Definition of FBOs

The literature included a variety of definitions for the term *faith-based organization*. Because the literature offered a variety of definitions, it was necessary to develop a working definition for this research. Bielefeld and Cleveland (2013) proposed delineating NGOs in three categories: not faith-based, moderately faith-based, or strongly faith-based. In 2006, Ferguson, Dabir, Dortzbach, Dyrness, and Spruijt-Metz created a more comprehensive definition; the authors classified organizations as faith-based if they:

1. Are within a church or congregation;
2. Focus on religion and/or are dependent on a formal religious institution;
3. Receive funding from a religious institution;
4. Have staff and/or members of their board of directors who are religious clergy;
5. Are directed by an individual motivated by his/her faith, religion, or spirituality; or
6. Use faith, religion, or spirituality as part of providing services to their clients. (p. 1515)

In 2015, Clarke and Ware suggested a broader definition, which included organizations evolved from religious foundations, including:

1. FBOs directly linked to a local congregation or religious leader;
2. FBOs directly linked to a religious denomination/sect/branch and are formally incorporated within the institutional organization of that religious body;
3. FBOs directly linked to a religious denomination/sect/branch, incorporated separately from that religious body, and;
4. FBOs that self-identify themselves as falling within a broad religious tradition, from which they draw their motivation. (p. 40)

Clarke & Ware's (2015) definition of FBOs is the one selected for this study. The American Red Cross and Habitat for Humanity, for example, had extensive involvement in this recovery, and both organizations have their foundations in Christianity (Benthall, 2016). Using Clarke and Ware's definition, it was appropriate to include these organizations in this study as FBOs.

The Colorado Department of Emergency Management identified all recorded NGOs that responded to the floods. This comprehensive list was captured in the COVOAD Agency Profile Matrix. The FBO population for this research was distilled from this list of volunteer organizations; this distillation involved identifying the NGOs involved in permanent housing and then determining which of these were FBOs as defined for this study.

NGOs meeting this criterion and listed in the COVOAD Agency Profile Matrix as responding to this disaster with the mission of housing recovery are the population of FBOs in this research. These FBOs were American Red Cross, Calvary Relief, Colorado Baptist General Convention, Habitat for Humanity, Life Bridge Church – Longmont, Mennonite Disaster

Services, Operation Blessing, Presbyterian Disaster Assistance, Samaritan's Purse, Serve 6.8, Westwoods, DiRT, and World Renew.

6.2 Research Questions

In Chapter III, research objectives were introduced for FBO PDRP. The first objective sought to determine if NPS elements were present or absent in FBO PDRP; the second research objective sought to measure perceptions of FBO PDRP effectiveness and efficiency. The FBO research questions were developed from the literature, which suggested that FBO PDRP was less formal and more effective than processes outlined in NPS (Buck et al., 2006; Forgette et al., 2009; Neal & Phillips, 1995).

To address the research objective relating to NPS elements in FBO PDRP, two research questions are identified:

FBO-RQ1: Are formal structures outlined in the NPS absent in FBO PDRP?

FBO-RQ1: Do FBO personnel perceive the PDRP used by FBOs as highly effective and Efficient?

6.3 Coding Procedures

This process used interviews with FBOs to collect qualitative data to test the research questions. As with the GO data discussed in Chapter V, interviews were conducted in-person and via telephone and recorded in July through November of 2016. The audio files for these interviews were transcribed by the same professional, using the same Institutional Review Board-approved confidentiality agreement. Identifying information was removed from the transcripts and then uploaded to the *NVivo* software for coding, sorting, and analysis.

Interview responses that related to the research questions included (a) statements pertaining to the presence or absence of NPS structure in FBO PDRP and (b) the interviewees' view of effectiveness and efficiency during this recovery. A data-driven coding scheme was employed (DeCuir-Gunby et al., 2011). Coding and analysis were completed between December 2016 and February 2017. The coding guide is shown in Table 6-1.

Table 6-1: FBO Codes for Qualitative Data Analysis

Code	Description	Example
Codes	Land use, planning, building codes – such as county requirements, International Building and Fire Codes (IBC, IFC).	"Getting volunteers up to speed to meet building codes was a real challenge."
Cooperation	Cooperation between GOs, FBOs, citizens. Each is a sub code.	"The COVOAD was the conduit; they set up the structure for us to cooperate with other church groups."
Effective	Comments referencing the effectiveness of a person, process, entity, etc.	"They went by the book; they were very effective in getting the word out to the homeowners."
Efficient	Comments referencing the efficiency of a person, process, entity, etc.	"It was a great use of my time."
Positive Mindset	Comments referencing a positive attitude or mindset of involved personnel.	"*[Individual]* came to every meeting with energy, enthusiasm, and a positive attitude."
FBO PDRP	Comments referring to GOs post-disaster recovery planning – the field side of planning, not a pre-disaster plan, rather what really occurred during recovery.	"We borrowed the processes and forms from *[Organization]*; we basically took their forms and added our logo to the top of the three-part forms."
Documents	References to documentation methods.	"We used Google-Docs to track progress."

6.4 Results

Response totals for coded items in FBO interviews are listed in Table 6-2.

Table 6-2: FBO Responses to Coded Interview Items

Code	Total Number of Responses	Number of Responses
Codes (Building, Planning Codes)	2	
Cooperation	30	
GO Cooperation		17
FBO-GO Cooperation		11
FBO-GO Non-Cooperation		2
Effectiveness	12	
FBO-PDRP Effective		8
FBO-PDRP Ineffective		4
FBO- Positive Mindset		14
FBO PDRP	90	
Communications		13
Previous Experience		9
Structured		36
Hierarchy		21
Unstructured		11
Documents	42	
Informal (Google/Yahoo/Excel)		24
Work Order		14
Work Assignment Sheet		4

6.4.1 FBO Structures during Housing Recovery

FBO-Research Question 1 (Are formal structures outlined in the NPS are absent in FBO PDRP?) was partially supported. References to structure (n = 36) occurred more than three times as often as references to unstructured processes (n = 116). NPS-like structures across FBOs were not identical; however, structures reportedly existed. One respondent pointed out the differences in FBO PDRP structures among FBOs by stating, “The Mennonites have their process; we have ours. They’re all similar but just a little different.”

From the literature, it was expected that a loose or absent FBO structure would be common in this recovery. Typical comments supporting this expectation were statements such as "we did not have a comprehensive preset plan." Another participant said, "We had awareness. I wouldn't say we had planning." Additionally, one respondent acknowledged, "We pretty much adjusted things on the fly." In reference to accountability for personnel, one supervisor responded, "If you ask me specifically what a certain volunteer was doing on a certain day, I probably could not tell you." The data did not fully support the initial expectation based on the literature; each of the FBOs in this study (n = 6) referred to a formal structure of their organization during the interview.

Several FBO comments (n = 11) suggested that much similarity existed between GO and FBO PDRP. One FBO employee suggested the forms used and organizational structures were "an outgrowth of federal processes." Many FBO comments mentioned work orders or, in NPS terms, division assignments. It appeared that the work order is a format used by many FBOs. The format and nomenclature for these documents is not reported to be uniform across the FBOs in this study.

Several comments suggested that NPS-like structure existed in FBO PDRP for this recovery. One respondent familiar with the NPS drew an analogy when referring to project leaders: "In the ICS world that [project lead] would be the equivalent of an incident commander. We have forms and functions that mirror somewhat what is done with government response." One FBO respondent described the way operations were coordinated as being a primary commonality between GOs and FBOs: "Probably the most similar is our emergency operations center . . . we staff the typical positions . . . we have a lead, we have finance, we have planning,

and we have logistics." Another example of similarity between GOs and FBOs related to command structure. NIMS and NPS terminology refers to an area commander as the individual with responsibility in an area with multiple commands (Moynihan, 2008). One FBO executive director stated, "We had an area supervisor. We had project leads. In between those two positions, we had supervisors that were responsible for our geographic area, usually identified by a major road or a river." Finally, a reference to a center of operations or—in NPS terms—a command post, was suggested by a field supervisor describing a dual use for a fifth-wheel trailer: "My wife and I are making it our home, number one and, number two, it's going to become a command center."

At the site - or incident - level, organizational structure was defined differently by different FBOs. One stated, "Our site supervisors made decisions on site . . . we actually had orange shirts for our site supervisors (1) and white shirts for our volunteers (2). We set that up, and it worked pretty well. These site supervisors reported to the captains. The captains would then dispatch skilled scouts (3) who would go and look at the jobs." These position references are easily cross- walked to the NPS or NIMS positions of branch director (1), division supervisor (2), and field observer (3).

The use of structured briefings and meetings for FBO personnel was mentioned several times: "In a pre-meeting, let's say each morning from 6:30-7:30, there would be a ton of that [brief] to match people up to the right places." Another briefing was described as "a quick meeting in the morning to talk about the goals and objectives for the day, review where the materials were, what tools were available, any permitting issues that had to be dealt with, and inspections that were coming up. Basically, just a down and dirty, 15-30-minute meeting

describing what we were doing for the day." Another respondent discussed debriefing stating, "We would set up a meeting at the end of the day where all of the supervisors would report back to our captains." These meetings are strikingly similar to operations briefings and debriefings delineated in NPS.

Many interview responses discussed documentation. Most often, documents are less formal than those articulated in NPS. In the case of a local church, they described repurposing the forms of an international FBO: "That fit really well . . . so we took their three-part form that was actually a carbon type . . . . That worked really well for us to print up a form that actually had their [householder] signature, what we were coming to do, what we weren't. Some liability stuff to make sure that the people were released from liability as they came on to the property to do things."

Google Documents and Excel spreadsheets were often mentioned by FBOs (n = 24). One respondent referred to Excel by saying, "I had spreadsheets that I created that mark everything off and, you know, it is not a perfect order all of the time because disaster relief doesn't work like anything else in the world, I don't care what it is." A respondent from a different FBO reported, "It was just Excel spreadsheets. They would print out a sheet specific to each job. It would explain items like the permit number, the homeowner, the contact information, and the scope of work to be completed."

One unexpected commonality across many FBOs was the use of work orders. Rather than mentioning incident action plans or division assignments typically used in the NPS, many FBOs referred to work orders (n = 14). These references were not limited to any one person or group of FBOs. Work orders were also discussed by other names (n = 4); some type of a document

outlining the scope of work to be completed at each site was discussed by every FBO interviewed (n = 6). Typical of these comments was the statement that “We pretty much use a work order system, and our team leads brief everyone in the morning on their work.” The equivalent NPS document is form ICS 204, also called the division assignment list.

An FBO superintendent described his responsibility related to work orders in these terms: “My job was to take the work orders, and decide how we were going to complete the work.” Project tracking was described as, “They [supervisors] would come in and say, ‘here’s what’s complete, here’s what’s needed,’ whether they closed the work order. We put the closed work orders in one pile.” One FBO referenced a similar system without using the term work order: “There were these work order kind of things, project sheets that had information about the project, and we were asked to keep those up-to-date.”

When asked about similarities between NPS and FBO PDRP processes, one respondent reported on their organization’s processes stating, “I believe it’s an outgrowth of federal processes. When you look at the recovery guidelines provided by the state and federal government, you see a lot of commonalities. If you look at [Organization]’s processes and forms under the same microscope, you’ll see many of the same similarities. I don’t know for certain but my guess is our forms have a tie to government processes.”

The number of references to position and hierarchy within FBOs (n=21) is of interest. Though no “standard” FBO structure was discovered in the literature review, an overwhelming number of FBOs described positions that could be compared easily to organizational positions identified in NPS.

6.4.2 FBO Roles in Housing Recovery—Perceptions of Effectiveness and Efficiency

FBO-Research Question 2 (Do FBO personnel perceive the PDRP used by FBOs as highly effective and efficient?) was not fully supported. It was clear from the literature that FBOs were often perceived as outperforming GOs in a post-disaster setting. Researchers suggested that the absence of rigidity in structure contributed to performance (Neal & Phillips, 1995; Scolobig et al., 2015). The personal commitment of individuals working with FBOs may have been an additional reason for exceptional performance.

Several comments reflected a belief that FBO PDRP was highly effective and efficient: "I believe we're probably more effective," and "they were either as good or slightly better [than GOs]." Such comments also reflected that their perceptions were a source of pride for the FBOs involved. The positive mindset and attitude of FBO personnel were repeatedly mentioned (n = 14) as the reason for their perceived effectiveness and efficiency.

Comments citing the effectiveness of FBO PDRP outnumbered those claiming it to be ineffective by a two-to-one margin (n = 8; n = 4). One reason cited in the literature for increased FBOs effectiveness is high personal commitment (Bielefeld & Cleveland, 2013; Phillips, 2014). A comment from an FBO respondent that aligned closely with the literature review was this one: "With the large amount of work associated with flood recovery, our volunteers got it. I mean they understood there was no time to waste, so I think they wanted to be very effective." Another respondent commented that "We're all working, not for a paycheck, but instead we're working to make people's lives better. There's something intangible about helping somebody when they feel so helpless. There's something that binds us together that I think makes us more effective."

Communication was considered to have a strong relationship with effectiveness and efficiency. FBO respondents made statements (n = 28) citing positive cooperation. Only two comments were made citing non-cooperation. Of the statement citing positive cooperation, the highest number of references were made describing cooperation among FBOs (n = 17). Typical of these comments is the following: “In the Boulder floods, this was even more the case. We worked through the COVOAD . . . and basically got contact lists and project needs through organizations participating with this VOAD.” Statements also reported positive cooperation between FBOs and GOs (n = 11).

6.5 Discussion

The research investigated NPS structure in FBO PDRP and its effectiveness and efficiency. The coded interview responses were analyzed and produced interesting and somewhat unexpected results. Though some FBO comments suggested loosely structured planning, the majority suggested structure existed. It appeared from the data that NPS-type structure existed in many FBO PDRP processes and, although it varies among FBOs, all interviewees offered examples of structure. These included organizational structure, standard forms, work orders, briefings, and documentation. These findings contradict FBO-RQ1.

Organizational structure including position, oversight, and organization were seen, for example, in one FBO’s personnel classification systems of scouts, captains, and supervisors. This included reference to an FBO leader overseeing logistics, finance, and planning functions in an Emergency Operations Center (EOC). The titles in GOs and NPS differed; however, functions were similar.

Effectiveness and efficiency were considered in the literature; however, discussions of the internal perceptions of FBO PDRP effectiveness and efficiency were absent. This research project engaged these data through interviews about these perceptions. Details for the structure and perception of FBO PDRP are presented below.

6.5.1 FBO Structure

The literature showed that in the limited-intervention model, funds come from various sources—public and private contributions as well as loans (Comerio, 1997; Comerio, 1998; Zhang & Peacock, 2010). This was supported by the data. Concerning GO funding, an FBO executive director stated, ". . . whether that was through state, federal, or other local flood recovery fund sources." In the statements referring to a local church's assistance, a respondent reported, "We had a team of folks that oversaw the funds that had been brought for that purpose and we set that fund aside separately. It wasn't tied to the church budget in any other way." Grants from FBOs were facilitated by case managers in the FRCs. Citizen loans from the SBA were cited by several FBOs. In reference to this private financing, one field supervisor suggested citizens "often will look to the Small Business Administration for some low-interest loans."

The literature suggested informal and ad hoc PDRP were prevalent (Davidson et al., 2007; Mitchell et al., 2012) among FBOs. However, these data contradicted this. The statements demonstrating structure in FBO processes included a hierarchy of positions and a reporting structure for personnel. Citing positions comparable to what NIMS and NPS refer to as overhead positions, an FBO director stated, "We had an area supervisor. We had project leads.

In between those two areas, we had supervisors that were responsible for our geographic areas." At the individual housing recovery job sites, "The superintendent was in charge of everything. He or she would have to assign the resources or assign the people for their best and highest use."

Planning processes were considered vital and needed to improve outcomes (Bayansalduz, 2012; Oliver-Smith, 1990). This finding was prevalent in the data. At the onset of PDRP, an FBO supervisor stated, "We had some planning meetings very early on." Developing an outcomes-oriented structure was also cited as important in the literature (Garnett, 2010). One FBO field operator suggested, "Planning for construction can be a real art. It seems like over-communication and documenting things on these work orders made a lot of sense."

The need for FBO assistance grew from reduced government assistance as noted in the literature. Researchers found that the gap was filled by FBOs (Quarantelli, 1995). An FBO superintendent described a financial need being filled by FBOs this way: "small grants homeowners who were substantially damaged who don't have insurance or don't have a way to do it [rebuild]." FBOs often referred to donated labor; typical statements included, "A lot of unskilled labor, and the semi-skilled labor came from these FBOs." In describing a particular FBO, a field supervisor stated, "for the most part they were laborers, they were farmers."

Research suggested that FBOs were often hesitant to acknowledge their religious character (McLeigh, 2011). This was not seen in the data. A respondent explained, "We made sure people were wearing shirts to identify them as to who they were associated with." FBO respondents were insistent that housing recovery was not an opportunity for evangelism: "We weren't helping because this is a faith exercise." This view was supported by comments such as this one: "This isn't a chance for us to spread the religion that we love and enjoy. It doesn't

matter if a person is Jewish, if they're Hindu, if they're Muslim, if they're a Buddhist, if they're a Christian, or if they are a non-believer, we're going to help them."

Elements of NPS structure existed in the PDRP of all FBOs interviewed. Standard NPS-type positions existed in this FBO paradigm; however, nomenclature varied from one FBO to another. In the words of one interviewee, "The Mennonites have their processes, we have ours, they're all similar just a little different." This study did not investigate whether the size of the FBO, length of involvement in housing recovery, tenure of personnel, or any of a myriad of variables played a part in the presence of NPS in FBO PDRP structure. The commonality of a work order system across many FBOs was intriguing. It is unknown if this evolved from sharing of best practices or if FBOs came to use this tool on their own.

6.5.2 FBOs' Effectiveness and Efficiency

The primary reference in the literature concerning FBO perceptions was the importance of partnering with local resources to increase effectiveness and efficiency (Sakai, 2012; Stajura et al., 2012). Instances of this are supported in the data. An FBO superintendent stated, "We insist on connecting with the local church . . . best way to do that is through the local church." To determine clientele or those in need, one FBO executive director stated, "We find the local church usually has a pulse on who needs help."

The other area of perception discussed in the literature was the higher effectiveness and efficiency of FBOs over GOs in recovery (Forgette et al., 2009). Support for this conclusion was seen in the data. Some, such as an FBO supervisor, expressed the thought that FBO PDRP processes were "about on par, or above average, maybe slightly above average." In a comparison with a GO project, one FBO field person suggested, "We did a better job of planning."

In the literature, the quality of communication is cited as correlating to the perception of effectiveness and efficiency (Comfort et al., 2011; Hector, 2010). Intra-FBO cooperation appeared to be widespread and not limited to a single or small group of FBOs. One respondent reported, “We do a lot of work with other FBOs. For example, we may divide and conquer . . . we try to share and cooperate with other FBOs.” COVOAD was reported as the conduit for FBO cooperation. Another FBO respondent reported, “We worked very well together. We have a common mission, and that’s to help people.”

Comments about non-cooperation were exclusively associated with FBO collaboration with GOs. Though only two statements citing non-cooperation were coded, they both referred to the mismatch between FBO PDRP processes and ICS. One participant reported, “there’s not a great handoff between incident command . . . a weakness in a lot of national response organizations is they know situational status but they don’t necessarily know work order from work order.”

The use of file-sharing applications appears to be widespread; Google Documents and Yahoo Group were mentioned (n = 24). Though not as formal as the documentation protocols suggested by NPS, this research suggested FBOs use online and computer-based document storage and tracking systems. A similarity to NPS was a series of FBO forms and personnel positions dedicated to, what is referred to in NIMS, as the documentation unit.

Communication and collaboration are reported to improve effectiveness and efficiency with FBOs. FBO communication systems appear to use consumer-grade electronics; smart phones, texting, and email were prevalent in this FBO housing recovery paradigm.

FBOs cited previous housing recovery experience as a factor that improved effectiveness and efficiency during this recovery. It was evident from FBO interviews just how much of a role previous disaster recovery experience played in their actions. Local churches referred to other Colorado disasters by stating, “We do a lot of local outreach. We did a lot of response to the Windsor tornados and some other wildfires.” Another local church described their efforts outside the state, “We also responded to the Katrina crisis. Then we also responded to the Joplin Missouri tornado.” An international FBO described learning from previous experience. Specifically, respondents mentioned repurposing the forms they used in a previous disaster: “Leveraging the forms that had worked well in other disasters, and quickly putting those into place.”

Several respondents added the context of faith to their interviews when asked if they had anything to add. The common theme and the message they most wished to communicate was that they were not using the recovery mission as an opportunity to spread their faith. One respondent said, “Our goal is really that we would help them because that’s our hearts, not because they might align or not align with our viewpoints or our thoughts around faith.” Another interviewee suggested, “I’d really like you to know that even though faith binds us together, that’s not the purpose of our calling, and it’s to help people.” This aligned with another comment: “The people doing this work aren’t doing it for money, they’re not doing it for recognition, and they’re not doing it because someone told them to. They all want to do the right thing and help people. They're all serving the Lord through the gifts God gave them.”

CHAPTER VII

BOULDER COUNTY HOUSEHOLDERS AND PERMANENT HOUSING RECOVERY

This chapter describes the research rationale and methods for collecting and analyzing data for householders' perception of effectiveness and efficiency of PDRP for housing recovery from the 2013 Colorado floods. The chapter discusses the data using nine research hypotheses defined for this aspect of the study. Results and analysis of these data are included, along with preliminary discussions.

7.1 Quantitative Data Gathering Related to Boulder County Householders

In limited-intervention or capital-infusion recovery models, householders carry the primary responsibility for financing housing recovery (Comerio, 1997). Because only 10% of the housing loss in the 2013 floods was insured, the need for housing recovery following this disaster was greater than the recovery from more typical Colorado disasters, such as wildfires in Colorado's WUI. The most vulnerable population impacted by these floods in unincorporated Boulder County was older adults. Because of the magnitude of the disaster, the housing recovery

need was filled, in part, by GOs and, in part, by FBOs. The scope of the disaster and the complexity of the recovery made it imperative for this study to gather data on householders' perceptions about key aspects of their experience.

Quantitative data gathered through questionnaire provided insight into householders' experience. This research collected data on householders' perceptions about the effectiveness and efficiency of PDRP for GOs and FBOs. The importance of planning was cited often in the literature (Chang, Wilkinson, Brunsdon, Seville, & Potangaroa, 2011; Olshansky, 2006).

The literature cited multiple challenges householders could expect in navigating GO processes post-disaster (Bolin & Stanford, 1991; Oliver-Smith, 1990). In this recovery, for example, householders had to navigate two distinct, but related GO processes at the outset. First, they had to request a government-issued building permit, and they also had to secure a hazard zone permit. These were two distinct, but related GO processes encountered by each participant.

Some householders sought assistance from FBOs and followed FBO processes. The literature cited a perception that FBO processes were often less structured than GO processes. (Johnson, 2007; Mitchell, Esnard, & Sapat, 2012). FBO processes were also reported in some literature to be more effective and efficient than GO processes (Neal & Phillips, 1995; Scolobig, Prior, Schroter, Jorin, & Patt, 2015). Data about householder perceptions of effectiveness and efficiency were gathered through surveys distributed between September and December 2016. Responses to the survey provided the quantitative data analyzed for this study.

7.2 Research Hypotheses

Research objectives guided the content of the householder questionnaire. From these objectives, nine research hypotheses were developed. Research hypotheses were phrased in a

manner that meshed with the literature. That is, the assumptions of less structured PDRP and greater effectiveness and efficiency were attributed to FBOs. Each research hypothesis proposed a difference in mean values; the corresponding null hypothesis for each research hypothesis was stated with no difference in means. The hypotheses investigated in this study were:

- **HH-RH1:** Householders' mean rating of GO meeting structure level, effectiveness, and efficiency are different.
- **HH-RH2:** Householders' mean rating of FBO meeting structure level, effectiveness, and efficiency are different.
- **HH-RH3**: Householders' mean rating of the ease of navigation of GO processes is different from their mean rating of the ease of navigating of FBO processes to complete permitted work.
- **HH-RH4**: Householders' mean rating of availability of information about planning for housing recovery from GOs is different from their mean rating of availability of information about planning for housing recovery from FBOs.
- **HH-RH5:** Householders' mean rating of levels of GOs being there to help them through the recovery process is different from their mean rating of levels of FBOs being there to help them through the recovery process.
- **HH-RH6:** Householders' mean rating of the ease of GO process navigation, information availability, and helpfulness are different.
- **HH-RH7:** Householders' mean rating of the ease of FBO process navigation, information availability, and helpfulness are different.
- **HH-RH8:** Females and males have different ratings on their overall experience with housing recovery following the floods.

- **HH-RH9:** Householders with longer active flood permits have lower ratings on their overall experience with housing recovery than householders with shorter active permits following the floods.

HH-RH1 and HH-RH2 investigate householders' view on planning meeting structure, effectiveness and efficiency. HH-RH3 to HH-RH9 use other measures to evaluate the overall planning process with GOs and FBOs. These measures include the ease of navigating the planning process, the information availability, and helpfulness.

7.3 Analytical Methods

Data were collected from mail questionnaires sent to householders in November and December 2016 and tallied in Microsoft Excel 2016. Statistical analysis was conducted using SPSS22, which was selected for a variety of reasons, the primary one being its wide use and acceptance by social sciences researchers (MacMillan & Koenig, 2004). Ease of use and compatibility with Microsoft Excel were also considerations in selecting this software. Descriptive statistics describe the demographics of the householder population.

Paired sample t-tests were used to compare the means of responses to paired questions. For example, Q28 asked, "*To what extent do you agree with the following statement: I was able to easily navigate the governmental process(es) to complete my permitted work.*" Q31 asked, "*To what extent do you agree with the following statement: I was able to easily navigate the FBO process(es) to complete my permitted work.*" Each of these paired questions elicited an answer based on the same five-point Likert scale ranging from strongly disagree to strongly agree (see Appendix).

Hypotheses HH-RH3, HH-RH4, and HH-RH5 were analyzed using paired sample t-tests. Using the means of responses to the paired questions from this group of householders, paired sample t-test analyses were completed. The significance level was $p < 0.05$. This is the conventional setting in social science studies.

Two hypotheses were investigated using independent sample t-tests. HH-RH8 compared ratings of overall experience in housing recovery (Q28, Q29, Q30, Q31, Q32, and Q33) between females and males. The test variable of HH-RH8 was householders' ratings of their overall experience during flood recovery. The grouping variable of HH-RH8 was gender. HH-RH9 compared ratings of overall experience in housing recovery (Q28, Q29, Q30, Q31, Q32, and Q33) between different lengths of time for which building permits were active. The test variable of HH-RH9 were householders' ratings of their overall experience during flood recovery. The grouping variable of HH-RH9 was the length of time that a permit was active. Given concerns related to sample size, comparisons were made between groups of householders whose permits were active for 120 days or less and those how had active permits 121 days or longer.

Repeated measures Analysis of Variance (ANOVA), a general linear model, was used to analyze questions regarding respondents' perceived structure level, effectiveness, and efficiency of GO meetings and the respondents' overall experience with housing recovery. These included HH-RH1, HH-RH2, HH-RH6 and HH-RH7. Selecting repeated measures ANOVA for these data was appropriate based on the dependent variable (DV). There was a single DV or householder rating for each independent variable (IV) or grouping variable in these data. ANOVA is reported to increase Type-1 error rates (i.e., rejecting a true null hypothesis or producing a "false positive"). This limitation supported use of repeated measures ANOVA. Thus, four multivariate

inferential statistics were used in this analysis, namely Wilks' Lambda, Pillai's Trace, Hotelling-Lawley Trace, and Roy's largest root[1]. The tests and their purposes are shown in Table 7-1.

Table 7-1: Inferential Statistical Tests Used in Study

Test	Purpose
Wilks' Lambda	Shows DVs' variance by IVs.
Pillai's Trace	Shows DVs' variance by largest separation of IVs.
Hotelling-Lawley Trace	Used if IV has two groups.
Roy's largest root	DVs' variance by the largest eigenvalue.

Wilks' Lambda (F-Ratio) are most often used for repeated measure ANOVA (Anderson, 2003; Olson, 1974; Stevens, 2009). The factor, or dependent variable in the data, was householder perception. The grouping variable was articulated by the questions asked. The data of householders' perceptions of GO meetings' structure level, effectiveness and efficiency were gathered in Q11, Q12, Q13, Q14, Q15, and Q16 (see Appendix).

Householders' perceived levels of GO process navigation, information availability, and helpfulness were addressed in Q28, Q29, and Q30 (see Appendix). The final hypothesis analyzed that used repeated measures ANOVA was householders' perceived levels of FBO process navigation, information availability, and helpfulness (Q31, Q32, and Q33).

In addition, power analyses were conducted to determine the sample size needs for this study. Since *t*-statistic and F-ratio (Wilks' Lambda) will be used to test the hypotheses, *G*Power 3.1.9.2*[2] was used to calculate the minimum sample size needed for each analysis. In addition, the effect size, α level and statistical power (1-β) was pre-determined for sample size calculation.

[1] Multivariate test was used because the household data violated the sphericity assumption. Under this circumstances, a multivariate approach is suggested (Vasey and Thayer, 1987).
[2] G*Power is a free statistical Power Analyses tool for Windows and Mac system. This program is provided by Department of Psychology, Heinrich-Heine-Universität, Düsseldorf, Germany. It is available from http://www.gpower.hhu.de/en.html.

Research by Cohen (1992) included a table from which social science researchers could choose an effect size based on the statistical test to be used and the levels of the visibility of an effect. Cohen (1992) identified three levels of effect size—small, medium and large—and stated that a medium effect size (.03) represented an effect likely to be visible to a careful observer's naked eye. The small effect size (.01) was considered noticeably smaller than medium, but not so small as to be trivial, and a large effect size (.05) was considered to be the same distance above medium as small was below it. The survey questions in this study were designed to be clear and easy for respondents to differentiate among the questions. Therefore, a medium effect size (.03) was used to calculate the minimum sample size needed.

In addition, the α level and statistical power (1- β) followed the conventional setting: α = .05, β =.20. The G*Power analyses concluded that at least 71 observations were needed for paired sample t-tests. This sample size had a statistical power of .80. The results also showed that at least 30 observations were needed for each group for repeated measures ANOVA. This sample size had a statistical power of .88. Therefore, a sample size of 80 provided enough power to detect difference among the groups.

7.4 Results

The total number of respondents for the survey was 80. This represents a return rate of 30% on the survey as the entire population of householders was 265. Table 7-2 shows the demographic characteristics of the respondents.

Table 7-2: Descriptive Statistics of Demographic Variables

Demographic	N	Mean	SD
Gender	68	1.53	.50
Age	64	61.86	11.86
Marital Status	64	2.12	.52
Education Level	65	4.26	.83
Race	64	4.84	.72
Ethnicity	59	.02	.13
Household Income Level	55	2.58	1.20

- Gender was measured by two levels: male = 1 (n = 32) and female = 2 (n = 36).
- Age was considered a continuous variable measured by year.
- Marital status had four levels: single = 1 (n = 4), married = 2 (n = 49), divorced = 3 (n =10), and widowed = 4 (n = 1).
- Education had five levels: less than high school = 1 (n = 0), high school/GED = 2 (n = 1), some college/vocation school = 3 (n = 19), bachelor's degree = 4 (n = 19), advanced degree = 5 (n = 32).
- Race have five levels. Respondents were predominantly white = 5 (n = 61). Other races reported were American Indian or Alaska Native = 1 (n = 1), Asian = 2 (n = 3), Black or African American = 3 (n = 0), and Native Hawaiian or other Pacific Islander = 4 (n = 0). Ethnicity was measured as a dummy variable (1 = Hispanic, 0 = non-Hispanic). Most respondents in this study were non-Hispanic (n = 58).
- Income levels were measured with five levels: less than $49K = 1 (n = 9), $50K-$ 99K = 2 (n = 22), $100K- $149K = 3 (n = 13), $150K-$199K = 4 (n = 5), more than $200K = 5(n = 6).

In addition, the questionnaire asked respondents their opinions of GO and FBO meetings; there were 11 questions for both types of meetings (see Appendix). Questions asked respondents how they learned about GO and FBO meetings and their opinions toward GO and FBO meeting structure, effectiveness, and efficiency. Figure 7-1 shows that most respondents received information about meetings from their friends or the internet. There were six questions measuring the perceived usefulness of these meetings (see Appendix). The questionnaire also asked respondents to report their overall experience with GOs and FBOs.

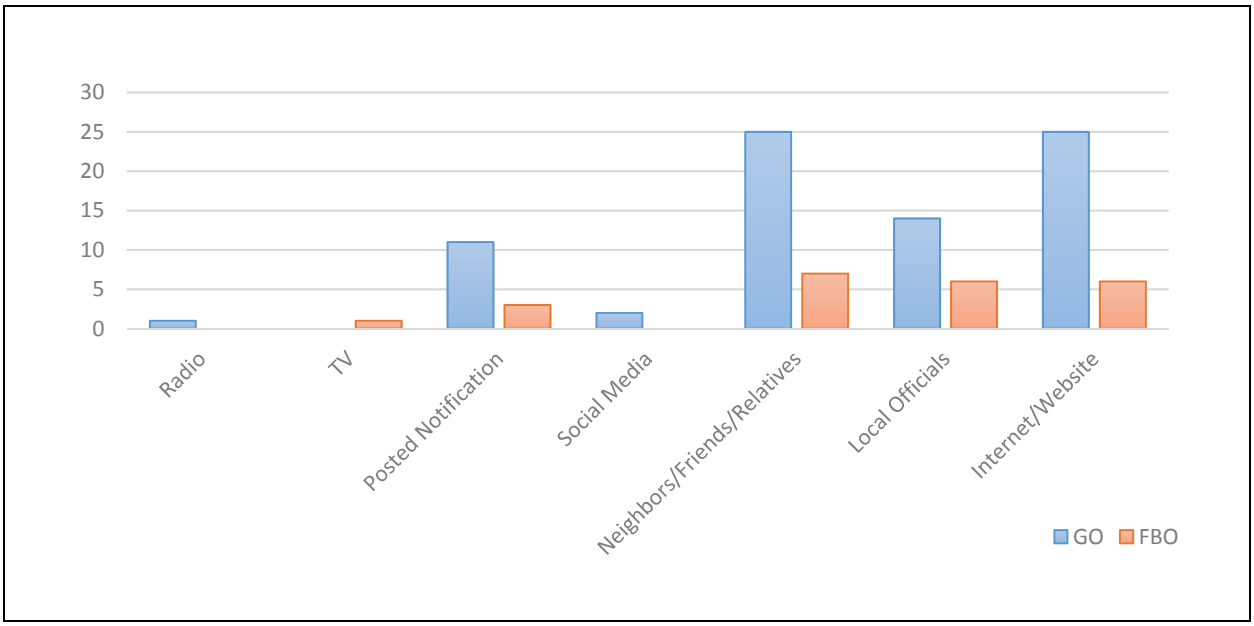

Figure 7-1. GO and FBO Meeting Information Source (n=80)

HH-RH1 (*Householders' mean rating of GO meeting structure level, effectiveness, and efficiency are different)* addressed the perceived levels of GO meeting structure, effectiveness and efficiency. Repeated measures ANOVA was used to test this hypothesis. The level of significance was set at the traditional 0.05 level. The test statistics were Wilks' Lambda and F-Ration. The Dependent Variable (DV) or factor was householder perception as measured on a five-point Likert scale (from Strongly Disagree to Strongly Agree). The Independent Variable

(IV), or grouping variable was the survey question (i.e., the measure of agenda, structure, participation, and minutes). The results indicated that householders' perceived levels of GO meeting structure, effectiveness, and efficiency were different (*Wilks' Lambda* = 0.04; $F_{(6,35)}$ =146.78, $p < 0.05$). Table 7-2 shows that the presence of a formal agenda had the highest mean (M = 3.68; SD = 0.91). A set agenda suggested GO structure in setting topics and timeframes for meetings existed. Meeting facilitation (M = 3.1; SD = 1.09) and encouragement of attendees to participate (M = 3.24; SD = 1.07) were reported by respondents. Follow-up documentation in the form of formal posted or distributed meeting minutes had the lowest mean of these data (M = 3.68; SD = 0.96). The means for effectiveness (M = 3.12; SD = 0.95) and efficiency (M = 3.59; SD = 0.95) were included in the analysis.

Table 7-3: GO meeting structure, effectiveness, and efficiency rating (n = 41)

Variables		**Mean Rating**	**S.D.**
Structure level	Written Agenda	3.68	.91
	Meeting facilitator	3.10	1.09
	Participation	3.24	1.07
	Formal Minutes	2.68	.96
Effectiveness		3.12	.95
Efficiency		3.59	.95

Wilks' Lambda = 0.04; $F_{(635)}$ =146.78, $p < 0.05$

This study was not able to statistically test HH-RH2 (*Householders' mean rating of FBO meeting structure level, effectiveness, and efficiency are different*) due to the sample size (n = 10). Only 10 survey respondents participated in FBO meetings. Figure 7-2 shows the mean ratings from these 10 survey respondents.

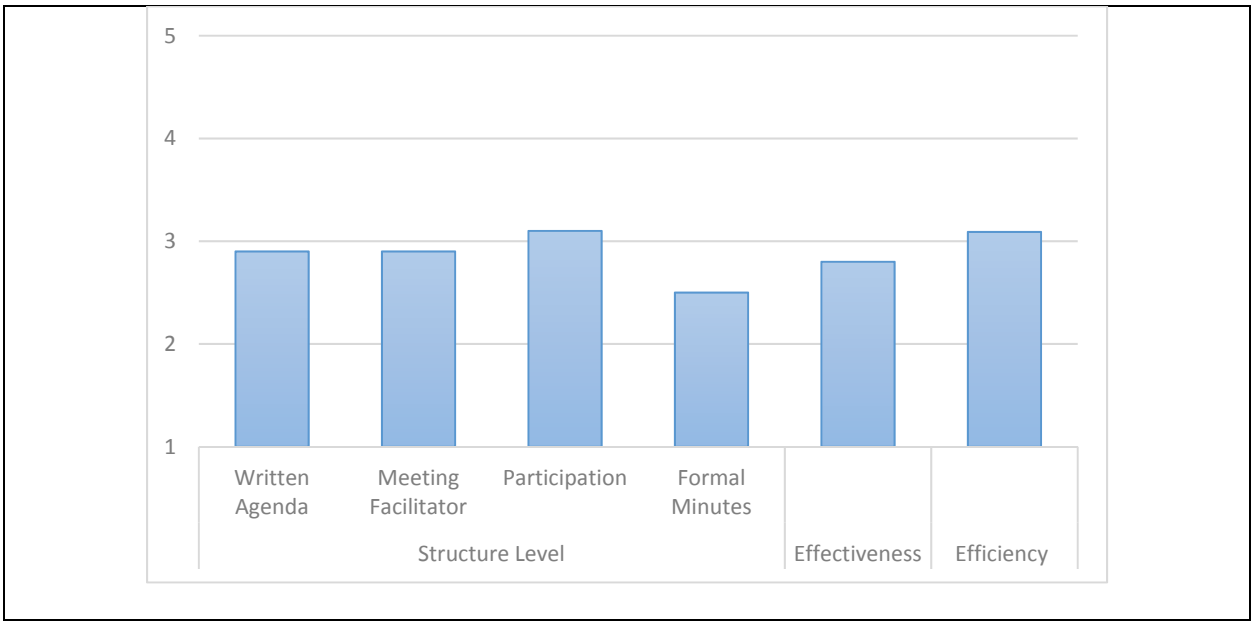

Figure 7-2: The mean ratings of FBO meeting structure, effectiveness, and efficiency (n = 10)

HH-RH3 (*Householders' mean rating of the ease of navigation of GO processes is different than their mean rating of the ease of navigating FBO processes to complete permitted work*) is supported. The paired t-test results suggested that the null hypothesis is rejected at the 0.05 level.

For the ratings of ease of navigation of GO and FBO processes (HH-RH3), the mean for GO perception was 2.92, and the mean for FBO perception was 2.17. The results suggested that householders' perceptions of the ease of navigation for GO processes were higher, than their perceptions of ease of navigating FBO processes ($t_{(58)} = 2.79$, $p < 0.05$).

Ratings of information availability from GOs and FBOs (HH-RH4: *Householders' mean rating of the availability of information about planning for housing recovery from GOs is different than their mean rating of availability of information about planning for housing recovery from FBOs.*) showed a statistically significant difference at the p = 0.05 level. The

mean for GO perception was 3.30, and the mean for FBO perception was 1.96. This result indicated that householders rated the availability of information from GOs higher than that from FBOs ($t_{(53)} = 4.83$, $p < 0.05$).

The test results of HH-RH5 (*Householders' mean rating of GOs being there to help them through the recovery process is different than their mean rating of FBOs being there to help them through the recovery process.*) was not statistically significant ($t_{(55)} = 1.27$, *ns*). These data suggest that the observed means difference ($M_{GO} = 3.00$; $M_{FBO} = 2.59$) was due to random.

HH-RH6 (*Householders' mean rating of GO process navigation, information availability, helpfulness is different*) addressed the householders' perception of ease of navigation of GO processes, availability of GO information, and feeling the GOs were there to help. Repeated measures ANOVA was used, and the level of significance remained at 0.05. The test statistics remained Wilks' Lambda and F. The DV (factor) was householder perception as measured on a five-point Likert scale (from Strongly Disagree to Strongly Agree). The IV, (grouping variable) was the survey question (i.e., the ease of navigation, availability of information, and feeling government was there to help householders through the housing recovery process). The results showed that householders' perceptions are different in these areas (*Wilks' Lambda* = 0.09; $F_{(3,68)} = 222.62$, $p < 0.05$). The mean rating of housing recovery information availability was the highest (M = 3.17; SD = 1.04). It followed, the mean rating of respondents who felt their government was there to help was the highest (M=2.97; SD = 1.26). The lowest mean rating was the ease of navigating during governmental flood recovery process (M = 2.94; SD = 1.33).

Conversely, HH-RH7 addressed the householders' perception of easiness of navigating FBO processes, availability of FBO information, and feeling the FBOs were there to help. Repeated measures ANOVA was again the test selected with the same level of significance and test statistics. The DV was householder perception, and the IV was the survey question (i. e., ease of navigation, availability of information, and feeling FBOs were there to help householders through the housing recovery process). The results showed that householders' perceptions in these areas were significantly different (*Wilks' Lambda* = 0.38; $F_{(3,52)} = 22.68$, $p < 0.05$). The feeling that FBOs were there to help had the highest mean of the three questions (M = 2.47; SD = 2.12). The ease of navigation of FBO processes was rated as the next highest (M=2.18; SD = 2.0). The item with the lowest mean rating was availability of information (M = 1.93; SD = 1.9).

HH-RH8 (*Females and males have different ratings on their overall experience with housing recovery following the floods*) investigates if females and males have different ratings on their overall housing recovery experience following the floods. Six independent sample t-tests were used to analyze these data. The DV was the ratings on questionnaire items 28-31 for aspects of their experiences with GOs and FBOs. The IV was gender with two groups (male or female). The test results of GO – easy to navigate (Q28), GO–agency was there to help (Q30), FBO–easy to navigate (Q31), FBO – available information (Q32), and FBO–organization was there to help (Q33), were not statistically significant. Only question 29 ("*Information about planning for housing recovery was readily available from government agencies*") showed statistically significant difference between male and female groups ($t_{(64)} = 2.63$, $p < 0.05$). The mean for males was 3.58 (SD = 0.81) whereas the mean for females was 2.97 (SD = 2.97). In this case, male respondents tended to agree with the idea that GOs made planning and housing recovery information available to residents.

Finally, HH-RH9 (*Householders with longer active flood permits have lower ratings on their overall experience with housing recovery than householders with shorter active permits following the floods*) investigated if the length of time a householder had an active or open permit had an impact on their ratings of the overall experience with this housing recovery. The research hypothesis expected that ratings would vary between householders with permits active for up to 120 days and householders with permits active for 121 days or longer. Independent sample t-tests were used to analyze these data. The DV was ratings on questionnaire items 28-31 for aspects of their experiences with GOs and FBOs. The IV was the length of time the FRP was open—less than or equal to 120 days, or 121 days or longer. Surprisingly, none of the test results showed any significant differences between the two groups. In each case, null hypothesis stating the variances are equal, could not be rejected. The mean ratings were similar.

7.5 Discussion

In the literature, planning was presented as vital to improving outcomes (Chang, Wilkinson, Brunsdon, et al., 2011; Oliver-Smith, 1990; Olshansky, 2006; Tas, M. et al., 2010; Zhang & Peacock, 2010). Literature suggested that the FBOs' were more effective than GOs' following disaster (Neal & Phillips, 1995; Scolobig et al., 2015). Unfortunately, it was not possible for this study to check the statistical difference between the two organizations' meetings because the study found only a few respondents attended FBO meetings (n=10). However, this study was able to compare the respondents' mean ratings among GO meetings' structures, effectiveness, and efficiency. The result indicated that respondents generally believed that GO meetings are well structured as evidenced by having a written agenda and giving people ample time and opportunity to participate (3.68 out of 5). The efficiency rating of GO meetings was

relatively high (3.59 out of 5), but the effectiveness rating was somewhat lower (3.12 out of 5) than the previous two items.

The literature suggested that the planning processes for FBO PDRP are loosely structured and ad hoc (Johnson, 2007; Mitchell et al., 2012) and that FBO processes are more efficient than GOs' highly structured planning process (Scolobig et al., 2015). From the analysis of HH-RH3 to HH-RH5, it can be inferred that an overall planning process was present in both GO and FBO PDRP. Although this study was not able to provide meaningful statistical analyses to address study objectives directly, the results of testing respondents' overall recovery planning process somewhat partially supported this suggestion by finding that householders' rating of ease of navigating through GO processes was higher than their ratings of navigating through FBO processes (HH-RH3).

In addition, the literature also noted that the agility of FBOs working outside the rigid structures of the NPS provided for flexibility (Acosta & Chandra, 2013). Data in this study showed that householders' mean rating of the availability of information from GOs was higher than that for FBOs. This result suggests that GOs were more efficient in distributing useful information. There were no statistically significant differences in HH-RH5, which rated perceptions that GOs and FBOs were there to help householders, suggesting that householders perceived GOs' and FBOs' availability similarly. Though not quantitatively investigated, the concept that GOs and FBOs "speak different languages" as reported in Chapter VI was considered. Shakespeare stated a rose by any other name is still a rose; similarly, NPS planning elements present in FBO planning, by any other name, may still be planning elements. Nomenclature for planning elements differed between GOs and FBOs.

No differences in overall planning process perceptions of PDRP between females and males were discovered in the literature. This was, however, an area that was investigated in HH-RH8. There were no statistically significant findings in the data to support differences in ease of navigation of GO and FBO processes, feeling their government and FBOs were there to help, or the availability of information from FBOs. However, the data showed differences between male and female respondents' perceptions of availability of information from GOs.

The literature suggests that GO intervention decreases with the passage of time (Bolin & Stanford, 1998; Hayles, 2010). The length of time a permit was open had no impacts on our respondents' overall experience during their recovery process (HH-RH9). This is an interesting finding, which may have inference to the receding GO intervention mentioned in the literature

CHAPTER VIII

GENERAL DISCUSSION

This chapter presents an overview of the study research objectives and methodology along with an aggregated discussion of study results. Research results and findings specific to the three populations were discussed in Chapter V for GOs, Chapter VI for FBOs, and Chapter VII for householders. In this chapter, discussions are aggregated, comparing and contrasting these earlier population-specific discussions as fodder for conclusions and recommendations. The discussion of study results in this chapter includes items related to NPS, the effectiveness and efficiency of PDRP, and additional findings and limitations of the study.

8.1 Overview of the Study Objectives and Methodology

This mixed methods research investigated PDRP for housing recovery following the 2013 Colorado floods in Boulder County. The bounded case study of the 2013 Boulder floods was used to gain insight into PDRP for permanent housing recovery. This case study was uniquely valuable for viewing both GO and FBO processes in a post-disaster recovery. The primary intent was to add to the knowledge base of an understudied area of recovery.

The 2013 flood was an atypical disaster, which required much greater involvement of FBOs to assist with housing recovery than had been true in previous Colorado disasters. Colorado's disaster experience typically results from wildfire, and most damaged or destroyed houses are insured. The 2013 Colorado floods left 90% of homeowners in the affected area facing recovery without private insurance.

The research objectives for this study were to determine the presence of NPS in GO and FBO PDRP and to measure the perception of effectiveness and efficiency of GO and FBO PDRP. Qualitative analysis of GO and FBO interviews, and quantitative analysis of householder questionnaires constituted the data sets. For clarity, these data were compared and contrasted in this study using the two overarching research objectives: (a) presence of NPS in PDRP and (b) perceived effectiveness and efficiency of PDRP. Research Questions and Hypotheses for each objective were discussed under these subheadings. Items of interest that emerged from the study and limitations of the study are also discussed.

8.2 Research Objective 1: NPS Structure in PDRP

The first research objective was to determine whether NPS planning structure existed in GO and FBO PDRP. Two populations possessed valuable insights into PDRP, namely GOs, and FBOs. Review of the literature suggested that NPS, prevalent in GO response, continues into recovery. Much of the literature suggested that FBOs operate differently from GOs. Using loosely coupled systems and informal structures, NGOs such as FBOs were believed to accomplish more than organizations that were bound by the NPS (Neal & Phillips, 1995; Scolobig, 2015).

However, data analyzed in this study suggested that NPS elements existed in both GO and FBO PDRP. This finding validated the literature about the continuation of NPS in GO PDRP in recovery. This finding confirmed GO Research Question 1, which states that GO PDRP follows the formal structured processes outlined in the NPS. The presence of NPS in FBO PDRP mostly contradicted FBO Research Question 1, which states that formal structured processes outlined in the NPS are absent in FBO PDRP.

The NPS is communicated to local government through the NDRF. Boulder County met

the NDRF mandate and provided objectives and structure by producing a Flood Recovery Plan Charter on October 31, 2013, less than 45 days after the flood. NPS structure, objectives, and organization articulated in the NDRF were present in this document, which guided the actions of state and local government in this recovery.

The county's charter created a flood recovery policy group and a flood recovery leadership group. The creation of these groups was another confirmation that NPS organizational structure existed in GO PDRP. The charter also identified the division of labor, which is a key tenet of ICS and the NPS. Included in the charter was a statement by a GO official recognizing the importance of matching capabilities to needs. The strategic, operational, and tactical objectives articulated in the charter were yet another verification that NPS structure existed in GO processes.

It is of interest that, in interviews, GO personnel stated the complementary nature of public, private, and FBOs in recovery. The statement was made that each organization had strengths and weaknesses and that synergy was created by cooperation. This speaks to the openness of at least this GO, Boulder County, to involve and include FBOs in the execution of their tasks. This open-mindedness and quest for cooperation was a positive finding, which also speaks to the blurring of lines between organizations studied in this recovery. The involvement of FBOs in FRCs and participation on funding committees speaks to an openness on the part of both GOs and FBOs to work for the common good.

The literature found that the NPS structure of GOs, which is prevalent in response, continues into recovery (Davidson et al., 2007; Hayles, 2010; Neal and Phillips, 1995). The continuation of NPS in recovery was supported by the data in this study. The high number of references to structure in GO PDRP as shown in Table 5-2 combined with only two references to

a lack of structure in GOs confirmed that formal structures of NPS existed in this GO recovery.

NPS language and terminology permeated the interviews of GO personnel who frequently referred to logistics, planning, finance, and operations. Therefore, the language of NPS existed in this GO PDRP. Developing objectives is the foundational element of the NPS Planning P as shown in Figure 2-1. GO comments that mentioned "setting strategic objectives" were common in GO interviews. These statements confirmed NPS existed in GO PDRP. The abundance of NPS abbreviations such as MSAs and RSFs confirm these NPS elements were major considerations in GO PDRP.

FBOs frequently cited components of the NPS as being present in FBO PDRP. For instance, they cited EOCs staffed with planning, logistics, and finance lead personnel. In the field, FBO area supervisors, site supervisors, captains, and skilled scouts divided labor and completed objectives. Though these are not all NPS terms, the functions of EOCs and the tasks assigned to these personnel clearly supported NPS systems in FBO PDRP.

The data supported the concept that NPS exists in GO PDRP, and GO personnel perceived importance of NPS structure. Comments referencing structure from GO personnel such as "it all comes down to processes and protocols" were prevalent. GO interviews often referenced the structure of their organizations and the structures that supported connectivity with the community. For example, interviewees described local public information officers and community members who facilitated two-way communication between householders and GOs.

FBO Research Question 1, *Formal structures outlined in the NPS are absent in FBO PDRP*, was mostly contradicted by the data in this research. Insights into FBOs setting objectives and planning also contradicted this research question, confirming that NPS structure existed in FBO PDRP. Comments referring to FBO hierarchical structure were often reported in interview

with FBO personnel.

One FBO used a personnel classification system, which included scouts, captains, and supervisors. This structure suggested that NPS personnel classification existed with FBOs. Although nomenclatures differed among FBOs, the personnel functions were easily cross-walked to NPS structures. Field NPS positions mentioned by FBOs included field supervisor, area supervisor, superintendent, field operator, and labor. Identifying field personnel by uniform, such as the use of colored shirts correlated by position, was cited in several FBO interviews.

A statement, such as “we had a team of folks that oversaw funds” was articulated by an FBO, suggesting the presence of an NPS-like finance section in this FBO. Additionally, staffing an FBO EOC with FBO leaders in, logistics, finance, and planning functions mirrored NPS positions even though FBOs used slightly different titles.

The absence of formal structures was partially supported in this study. Data aligned with concepts presented in the literature characterizing some FBOs as having loosely coupled or ad hoc structures (Davidson et al., 2007; Neal & Phillips, 1995; Scolobig et al., 2015). Comments from FBO personnel, such as “we did not have a comprehensive preset plan” and “I wouldn’t say we had planning” supported the concepts presented in the literature.

However, the overwhelming majority of items coded in FBO interviews referenced structure and reinforced the formal structures outlined in the NPS. These references confirmed NPS structures existed in FBO PDRP. In addition, some FBO personnel cited direct linkage to NPS structure, facilities, and position. One interviewee went so far as to hypothesize that their FBO processes were “an outgrowth of federal processes.”

The use of meetings, briefings, and other NPS events was mentioned frequently in FBO interviews. Both pre- and post-briefings were discussed in addition to meetings dedicated to

planning for recovery. The prevalence of meetings and planning sessions contradicted the belief that NPS systems were absent in FBO PDRP.

The household survey descriptive statistics also showed some insights of GO and FBO's involvements of flood recovery planning. FBO meeting information is reported in Figure 7-1; the data showed that householders were extremely unaware of FBO meetings as compared to their reported awareness of GO meetings. However, in their interviews, FBOs reported hosting regular meetings in the community. It appears the communication from FBOs to householders was somewhat lacking.

In addition, only few householders attended FBO meetings during their recovery process. In fact, the study found too few attendees to do any statistical analysis. Though this data might have been valuable in analysis, the fact that so few householders attended FBO meetings also speaks loudly. With reported low levels of communication about FBO meetings, it is possible that few householders knew of FBO meetings. Many GOs stated their communications to householders included notifications of FBO meetings. The presence of FBOs in FRCs suggested opportunities for householders to have knowledge of the times, places, and locations of FBO meetings existed.

8.3 Research Objective 2: Perceived Effectiveness and Efficiency of PDRP

The second research objective stated in the study was to gauge GOs, FBOs, and Householders' perceived efficiency and effectiveness of PDRP for permanent housing recovery following the 2013 Boulder floods. Three distinct populations (GOs, FBOs, and householders) who possessed valuable insights into PDRP were included. Review of the literature suggested GOs, bound by rigid NPS elements, would be less effective in disaster recovery than FBOs. The

data collected and analyzed contradicted this assumption. The research question (FBO-RQ2) that FBOs perceive their PDRP as highly effective was supported by these data. What is perhaps most interesting are householder perspectives on GO and FBO PDRP. Householders' perceptions about the availability of information from GOs was higher than householder perceptions of FBO information availability. This is an unexpected finding in this research.

Despite householders' low attendance at FBO meetings, the highest mean in householder Research Hypothesis 7 was householders' belief that FBOs were there to help. This speaks highly to the FBOs' ability to communicate caring and compassion through much less contact with householders than the more prevalent contact of GOs with householders.

From Research Objective 2, nine research hypotheses were developed to measure householder perception of GOs and FBOs. Data were assessed using analytical statistics. Householders detected differences in GO meeting structures, effectiveness, and efficiency. Reports of structured agendas and formal meeting structures did not influence overall perceptions of effectiveness and efficiency by householders. It appears that formal agenda was emphasized more often than follow-up documentation, such as the posting or distribution of minutes, in GO meetings. It is unclear if householders appreciated meeting structure, thought it was important, or were disappointed that minutes were not captured.

No statistically significant differences existed in most of the householder perceptions of overall housing recovery items either by gender or by the amount of time a building permit was active. The study showed that the length of time a permit was open had no significant relationship with householder perceptions. The receding GO presence with the passage of time did not influence householders' perceptions of their overall experience with housing recovery in this study.

The population of householders was racially homogenous and comprised nearly the same number of females and males. This study showed no significant differences in their perceptions of the overall housing recovery experience except for responses to one question; *information about planning for housing recovery was readily available from government agencies*. Females perceived lower availability of information from government organizations than males, and the differences were statistically significant.

Research Objective 2 addressed householders' perceptions of effectiveness and efficiency of PDRP. HH-RH3 showing a statistically significant difference between the ease of navigating GO and FBO processes. However, responses from householders showed no significant difference in their perception that GOs and FBOs were there to help them through the recovery process (HH-RH5). Therefore; there is not an overall consistency in the data. There are; however, many indications householders' viewed GO processes as effective and efficient more often than they held this view towards FBO processes.

A significant portion of the literature suggested that the government is not prepared to assist (Bolin & Stanford, 1998; Hayles, 2010). This view was primarily contradicted in this research. GO personnel often cited their belief that they were appropriately assisting and that their work with citizenry was highly effective. Their belief was confirmed by householder survey responses and the confirmation of HH-RH3 and HH-RH4. Data related to these research hypotheses confirmed that householders viewed the ease of navigating GO processes and availability of information higher for GOs than FBOs.

The effectiveness and efficiency of FBOs was perceived highly by FBO personnel. FBO personnel stated their perception that FBOs were more effective and efficient than GOs. Statement such as "I believe we're probably more effective" were common in FBO interviews.

Comments of FBO personnel proclaiming effectiveness outnumbered statements of ineffectiveness by a two-to-one margin. The explanations for this effectiveness also supported the concepts in the literature that personal commitment of FBO personnel is higher than that found in GOs. “Positive mindsets and attitude” of FBO personnel were cited by FBOs as reasons for increased effectiveness and efficiency. The desire to help householders through a very difficult time and aversion to wasting time was also discussed by FBO personnel.

Data from GO interviews confirmed that GO activities tapered off with the passage of time as reflected by the reduction in the number and frequency of meetings. Closing FRCs in 2017 also supports the literature suggesting receding GO involvement.

The study uncovered statements suggesting efforts to the contrary. GOs were actively assisting householders more than three years after the disaster. One county official cited ongoing efforts to help a homeowner navigate the grant process, facilitated by Catholic Charities. In other instances, the county was still advocating for 10 to 12 householders who are navigating buyout programs to compensate them for not rebuilding in hazard zones. This data shows that GO involvement was present despite the passage of time.

Despite many GO personnel’s strong belief that their processes were effective and efficient, several people voiced a conflicting viewpoint. Some GO personnel raised concerns with GO bureaucracy. One GO staff person stated a preference for a more devolved process by saying, “I believe the work order system could be far more effective, much less bureaucratic, and much closer to the field.” It is noteworthy that householders perceived statistically significant differences in ease of navigating GO and FBO processes, as demonstrated by the responses to HH-RH3. This finding was contrary to the doubts raised in the literature suggesting difficulty in navigating GO processes.

8.4 Items of interest

Several items, not originally considered in the development of research objectives, questions, and hypotheses surfaced during this study. In exploratory research, it is important to articulate these findings to assist future researchers with hypothesis development.

8.4.1 Homogeneity of Householder Population

The first such item relates to the householder population sampled. The population responding to the survey was predominantly white (76%), married (61%), with either bachelor's or advanced degrees (63%). Based on these demographics, it would be inappropriate to generalize the results of this study to other populations. But it is reasonable to believe that the respondents' demographic characteristics of this study are similar to the typical household survey respondents comparing to other studies. (e.g. Wu et al., 2017).

Another area of interest was the way in which these householders received information about meetings. The quantitative data in Chapter VII shows the top two methodologies listed for GO communication were the internet and neighbors/friends/relatives. This was nearly double the next highest source, as shown in Figure 7-1.

8.4.2 Previous Disaster Experience

Another unexpected feature of the study results was the importance of previous disaster recovery experience as cited by both GOs and FBOs. The Four Mile Canyon Fire was referenced often by the county representative, suggesting organizational learning and building on previous disaster experience. The Flood Recovery Manager reported reaching out to "contacts" developed in the Four Mile Canyon Fire to assist with flood recovery.

FBOs also cited previous housing recovery experience as a factor improving effectiveness and efficiency during this recovery. It was evident from FBO interviews just how

much of role previous disaster recovery experience played in their actions. Local churches referred to other Colorado disasters stating, “We do a lot of local outreach. We did a lot of response to the Windsor tornados, and some other wildfires.” Another local church described their efforts outside the state, “We also responded volunteers to the Katrina crisis. Then we also responded to the Joplin Missouri tornado.” An international FBO described learning from previous experience. Specifically, they described repurposing the forms they used in a previous disaster, “Leveraging the forms that had worked well in other disasters, and quickly putting those into place.”

8.4.3 Cooperation, Communication, and Collaboration

Though cooperation between GOs and FBOs was not explored in depth, both GOs and FBOs cited the importance of cooperation. GOs characterized cooperation between GOs and FBOs as in positive terms nearly four times as often as negative terms. A GO comment that effectiveness and efficiency require cooperation supported the concept that cooperation was essential for success.

Communication and collaboration within FBOs and between FBOs were reported to improve effectiveness and efficiency. FBO communication systems appeared to be primarily through consumer-grade electronics, such as smart phones, texting, and email. These methods were common in this FBO housing recovery paradigm. FBO documents were often stored in online file sharing applications such as Google Documents, and FBO communication reportedly occurred through Yahoo Groups. Several FBOs cited the use of Microsoft Excel as a project tracking system. Additionally, the extensive use of texting, cell phones, and email suggested communication channels existed. It appeared that the modes of communication were somewhat less formal among FBOs than GOs.

One GO entity cited some difficulties working with FBOs because of differences in organizational language and jargon. They cited difficulty discussing inefficiencies or shortcomings in working with FBOs. One GO official took this even further, stating that core cultures and operating styles differed between GOs and FBOs. Additionally, another GO official stated that the elements of language, protocol, and messages differed vastly between GOs and FBOs.

8.4.4 Faith

Several FBO respondents commented on faith when asked if they had anything to add to their interviews. The common theme and the message they most wished to communicate was that they were not using the recovery mission as an evangelical opportunity or an opportunity to spread their faith. One respondent said, “Our goal is really that we would help them because that’s our hearts, not because they might align, or not align with our viewpoints, or our thoughts around faith.”

Another interviewee shared, “I’d really like you to know is that even though faith binds us together, that’s not the purpose of our calling, and it’s to help people.” This view aligns with another comment that, “The people doing this work aren’t doing it for money, they’re not doing it for recognition, and they’re not doing it because someone told them to. They all want to do the right thing and help people. There all serving the Lord through the gifts God gave them.”

8.4.5 Emotional Support

An unexpected and valuable tangent of the research surfaced in the references to the emotional support of both citizenry and GO personnel. Though the role of emotional support was not hypothesized, the issue came up often in GO interviews. FRCs were described as much as venues for householders to decompress or vent as areas to receive assistance. One GO official

reported that the staff “quickly learned it was about listening to people’s stories and being there to support them.”

GO leadership recognized the stress that disaster recovery was placing not only on citizens, but also on GO personnel. Citizens were directed to professional counseling through a voucher program. GO staff was trained how to both deal with traumatized householders and how to recognize and deal with the impacts that proximity to this trauma was having on them. This is an area ripe for future research.

8.5 Limitations of the Study

This study contained several limitations that must be noted. These included the limited scope of this study, sampling, the length of time between the disaster and this research, the reliance on self-reporting, and potential skewing of responses in an interview to either protect or discredit an entity. Though there is no reason to believe these limitations influenced data, they must be acknowledged.

This case study was small in comparison to other research projects. The population of householders proved to be extremely homogeneous. The limitations of purposeful sampling for qualitative data collection missed a number of respondents who might have been contacted through other sampling techniques. Also, the possibility that respondents recommend like-minded individuals in snowball sampling is a limitation cited in the literature (Rubin & Rubin, 2005).

It is also important to note that the experience, perception, and opinion of 48 householders whose homes were destroyed were not included in these data. The limitation of not

being able to readily contact householders who were unable to rebuild must be noted. These householders' residences were located in hazard areas, and the GO process of navigating a hazard mitigation review may have been valuable additions to these data. Ultimately, their homes were, or will be, bought out by government programs. It is anticipated their impressions of GO process may differ greatly from the householders included in the study.

It is conceivable that a respondent's affiliation with a particular GO or FBO could influence their responses. It is also possible that a householder may have allegiance or distrust for a particular GO or FBO. Feelings of alignment or disparity with GOs or FBOs could influence their responses to survey questions.

The timing of the study, three years after the disaster, is another limitation of the study. Perishable data were lost, and relying on memory of perceptions may have influenced reporting. (Bloomberg & Volpe, 2008). By design, the study relied on data collection from three perspectives, analysis, and triangulation of the data in an effort to minimize these limitations.

CHAPTER IX

CONCLUSIONS AND RECOMMENDATIONS

The results of this mixed methods study were intriguing. In some instances, results aligned with the literature and supported the expectations stated in the study's questions and hypotheses. In other instances, the data led to findings that contradicted expectations. Most importantly, the data and research analysis laid a foundation for future studies in the discipline of planning for disaster recovery. Analysis completed on these data sets addressed two specific research objectives and signaled the potential for additional analysis of these data to address different objectives. This chapter presents concluding remarks about the research objectives, implications of this study, and recommendations for future actions and research.

9.1 Research Objective 1: NPS Structure in PDRP

The research question that structure aligning with the NPS exists in GO PDRP was supported. The study focused heavily on county government, and data clearly showed the direction set forth in the NDRF was met. The Boulder County Flood Recovery Plan Charter was the principal document guiding actions related to permanent housing recovery. GO structures, hierarchies, and documentation demonstrated the existence of NPS in PDRP.

GO connectivity with the community was deliberate and well-received by Boulder County householders. The Flood Recovery Manager leveraged relationships developed in the

Four Mile Canyon Fire of 2010 to establish two-way connectivity with the community. These "local PIOs [public information officers]" were reported to be valuable to facilitate communication. The county used community meetings as the primary means of initiating connectivity with homeowners.

Structures, in the form of FRCs, created a specific location for householders to gather information about recovery and begin the process for residential repair or replacement. Case managers served as the primary connective link with householders. FBOs were welcomed into the FRCs and used these structures to contact householders.

The receding of GO intervention was partially supported by the projected closing of FRCs and the reduced frequency of meetings with the passage of time. Over time, weekly meetings transitioned to monthly and then quarterly events as interventions slowed. Additionally, the GO planning cycles engaged with the Planning P extended dramatically as the recovery extended. There was evidence; however, supporting a strong GO presence in assisting householders more than three years post-disaster. Thus, a portion of this research question, which sought to determine the presence of NPS in PDRP, aligned with expectations for GOs.

What was unexpected, and did not align with the literature for this research question, was the presence of NPS in FBO PDRP. The NPS structure existed even though each FBO used slightly different naming conventions. Data substantiated that FBOs had EOCs and leads in key groupings of command, planning, operations, logistics, and finance. This structure confirmed the presence of NPS in their systems. Interview comments to the effect that FBO processes might be based in federal systems were also telling.

The question must be raised: What has changed since the declarations of loosely coupled, ad hoc FBO systems were described in the 1990s literature? It is the opinion of this researcher that FBOs have increased their use of NPS elements since the 1990s. Some FBOs may have arrived at using similar planning processes through discovery of best practices with their repeated recovery responses. More likely, some FBO personnel who have completed NPS training may have incorporated NPS systems into their FBO processes. Such acceptance would not necessarily be an endorsement of NPS; rather, it simply shows that FBOs are seeking best practices and refining the terminology and structure to best meet their needs.

9.2 Research Objective: Perceived Effectiveness and Efficiency of PDRP

For this research objective, the findings from GOs and FBOs were not surprising from and organizational perspective. GOs felt their PDRP was extremely effective, as did FBOs. However, some GO personnel viewed the bureaucracy of some NPS processes as counterproductive. They cited the use of work orders closer to field operations and potentially more effective operationally.

The perception of householders is of special interest. In the opinion of this researcher, these “end users” of the systems have the most germane perceptions of effectiveness and efficiency. In general, householder perceptions of ease of navigating processes and information availability scored higher for GOs than FBOs. This was an unexpected finding.

It is the opinion of the researcher that this finding is not primarily a measure of performance; it may largely be a matter of awareness. From their interviews, it was clear that FBOs held informational meetings and provided materials; some FBOs also had a presence in FRCs. With these elements in place, this researcher was left to ask: Why did so few of the

surveyed householders attend FBO informational meetings? The number of attendees was so low, in fact, that it lacked sufficient statistical power to produce useful findings. By contrast, householders showed focused high levels of responses to receiving information through neighbors/friends/relatives and internet/website as modes of learning about GO meetings. The reasons for this discrepancy were not investigated; however, it could be hypothesized that less communication was offered by FBOs or that householders were not aware of or seeking information from FBOs.

A possible reason for this discrepancy could be rooted in demographics. FBO officials reported working through local churches to find householders who needed assistance. FBOs often referred to their partnerships and cooperation with local churches. By design, the householders responding to this study were located in the less densely populated areas, that is, unincorporated Boulder County. Further, the respondents were primarily older adults living in remote areas; they may not have interacted with the local churches to the extent that people living in more urban settings may have. There may be other contributing factors such as church attendance among adults in this group that were not measured in this study.

Another area of interest from the perspective of the householder is the difference in responses to this questionnaire statement: “I was able to easily navigate the governmental processes to complete my permitted work.” Answers from female respondents were lower than for male respondents, giving the implication that some female respondents may have perceived difficulty in navigating GO processes. The overall findings from all respondents showed a high level of positive perceptions for GOs except in this area, which has the potential to be concerning. Unfortunately, this research did not determine the reason for this concerning perception.

9.3 Concluding Remarks and Recommendations

The study design was articulated to investigate questions and test hypotheses formulated by existing literature, or Level II research as described by Grossen (1996). The abundance of information uncovered clearly validated the importance of this research. The intense efforts and long hours of preparing, compiling, and analyzing these mixed methods data were fruitful. This researcher is optimistic that additional explorations into identified research opportunities will spring from this research. The knowledge base in this understudied area of PDRP for permanent housing recovery is still extremely limited.

The existence of NPS-like planning systems in at least some FBOs was confirmed by this research. It would be of interest to determine the genesis and evolution of the processes in subsequent studies. In the late 1990s, research described command and control as less prevalent with NGOs than it appears to be in this case study. Through a retrospective study of select FBOs, research could be undertaken to investigate the development of NGO planning processes and organizational systems. The process changes may be correlated to experiences with major disasters or events or with major governmental directives such as the NIMS, NPS, or NDRF.

COVOAD's role in organizing and communicating with FBOs in this recovery is another area of particular interest. It is plausible that COVOAD's connections with the State of Colorado and federal planning systems may have influenced FBO PDRP. It would be of interest to look at other similar volunteer organizations to compare their involvement in disasters. A longitudinal study of COVOAD and NGOs may have correlations with the apparent increase in NPS in FBOs.

Perceptions of householders involved in housing recovery is another consideration for future studies. Though the length of time a permit was open did not influence householder perceptions in this study, there may be other factors that correlate with perception. Severity of damage and the final disposition of the recovery–whether it was repair, replacement, or a buyout–may influence householders' perceptions.

The perspectives GOs have towards FBOs and conversely the feelings of FBOs towards GOs is another area ripe for future studies. Some anecdotal examples of mutual respect existed in the interview data; however, other comments spoke of mistrust and suspicion. Overall, it appears the two types of organizations have grown more similar in structure. Studies to address this perception would be welcome additions to the knowledge base.

The final area of special interest to this researcher is the emotional side of recovery. A major unexpected finding of the research was the emotional impact disaster recovery had on so many involved. Householders declared the need for emotional support. It appeared that FRCs became counseling centers in many cases, and FRC staff became quasi-counselors. Boulder County quickly recognized these challenges and reacted appropriately. They trained their staffs and assisted in getting professional counseling for householders where appropriate. The emotional aspect of housing recovery in this disaster being more reactive than proactive points to another area ripe for future research.

One recommendation of this researcher is to communicate the findings of this bounded case study. Distilling and publishing findings contained herein in various academic journals is the logical avenue for disseminating information. From these communications, comparison can

be drawn with other research. Repeating the study in subsequent disasters and longitudinally comparing results would prove fruitful.

More importantly, hypotheses from this study could be tested in future studies. These findings may point to a closing of the gap between GO and FBO planning processes. It would be of interest to determine if similar alignment is occurring in other aspects of disasters, such as in the initial phases of response where planning is much more focused and deliberate.

More studies into the outputs and outcomes of planning for recovery are needed. This study measured perceptions; it would be equally beneficial to compare perceptions with performance. Items such as comparative cost of recovery projects, length of time permits were active, and levels of homeowner satisfaction with the final product along with any correlation with GO or FBO involvement would be valuable.

This research met the objectives as stated; its greatest strength is its addition to the knowledge base in this understudied area. Although this is a single-case study and it would be inappropriate to generalize the findings, the research paves the way for future studies. The planning process is a key to successful recovery. This research increased understanding of PDRP for permanent housing recovery in the context of the 2013 Colorado floods in Boulder County.

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APPENDIX

HOUSEHOLDER QUESTIONAIRE

Investigation of Planning Processes for Housing Recovery Following the Colorado 2013 Floods

A survey for a PhD Dissertation

by Kevin Milan, Primary Investigator

Boulder County Records show a residential 'Flood Related' building permit was issued to you by following the Floods of 2013. Please answer the following questions by placing a checkmark next to your answer ☑

1) Was this permit related to flood damage?
   - ☐ Yes
   - ☐ No (proceed to question 6)

2) Was the permit issued for:
   - ☐ Your Primary Residence?
   - ☐ An outbuilding or structure other than a residence?
   - ☐ A rental or income property?
   - ☐ Work you completed for someone else (you did not own the property?

3) How long was the building permit active or 'open'?
   - ☐ Less than 30 days
   - ☐ 31-60 days
   - ☐ 61-120 days
   - ☐ More than 120 days

4) Did any Faith Based Organization(s) (FBOs) provide assistance in completing the permitted work?
   - ☐ Yes
     - o Monetary assistance
     - o Donated materials
     - o Donated labor
     - o Other: _____
   - ☐ No (proceed to question 6)

5) If you received FBO assistance, which organizations assisted you (check all that apply)
   - o Calvary Relief
   - o Colorado Baptist Disaster Relief
   - o Lutheran Disaster Response
   - o Mennonite Disaster Services
   - o Operation Blessing
   - o Presbyterian Disaster Assistance
   - o Samaritans Purse
   - o Serve 6.8
   - o World Renew
   - o Other(s):_____

In the next series of questions, consider the planning meetings held by governmental organizations. (FEMA, State of Colorado, Boulder County, Cities, Towns, and Special Districts).

6) Did you attend any informational or planning meetings or sessions sponsored by governmental organizations (such as those listed above) related to housing recovery?
   - ☐ Yes
   - ☐ No (proceed to question 17)

7) Which organizations meeting(s) did you attend? (check all that apply)
   - o State of Colorado
   - o Boulder County
   - o City (list all) _____
   - o Town (list all) _____
   - o Special District (list all) _____
   - o Other(s):_____

8) How often were these governmental meetings typically held by **each** organization in the six months following the floods?
   - ☐ Weekly
   - ☐ Every other week
   - ☐ Monthly
   - ☐ Less frequently than once per month

9) How did you learn that these meetings were occurring?
   - ☐ Radio
   - ☐ Television
   - ☐ Posted notifications
   - ☐ Social Media (facebook, twitter, etc…)
   - ☐ Neighbors, friends or relatives
   - ☐ Local officials
   - ☐ Internet / website
   - ☐ Other: _____

10) How many of these meetings did you attend?
   - ☐ None
   - ☐ 1-5
   - ☐ 6-10
   - ☐ 11+

11) To what extent do you agree with the following statement:

The agenda for the meetings were highly structured with a written agenda containing the specific topics, and an allotted time for each topic.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

12) To what extent do you agree with the following statement:

The meeting was conducted with a formal structure such as Roberts Rules of Order; and had a designated chair person or meeting facilitator.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

13) To what extent do you agree with the following statement:

Attendees were given ample time and opportunity to participate in the meetings. The concerns raised were heard, valued, and acted upon.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

14) To what extent do you agree with the following statement:

Formal minutes of the meeting were compiled and posted and or distributed to attendees.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

15) To what extent do you agree with the following statement:

The meetings were highly efficient and worth my time to attend.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

16) To what extent do you agree with the following statement:

The meetings were an effective tool to distribute information and part of an effective planning process for housing recovery.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

In the next series of questions, consider planning meetings held by Faith Based Organizations (FBOs).

17) Did you attend any informational or planning meetings or sessions sponsored by FBOs (such as Red Cross, Calvary Relief, Baptist General Convention, Habitat for Humanity, etc…) related to housing recovery?
- □ Yes
- □ No (proceed to question 28)

18) Which organizations meetings did you attend? (check all that apply)
- o American Red Cross
- o Calvary Relief
- o Baptist General Convention
- o Habitat for Humanity
- o Lifebridge Church
- o Mennonite Disaster Services
- o Operation Blessing
- o Presbyterian Disaster Assistance
- o Samaritans Purse
- o Serve 6.8
- o Westwoods DiRT
- o World Renew
- o Other(s):_____
- o Other(s):_____

19) How often were these FBO meetings held by each organization in the six months following the floods?
- □ Weekly
- □ Every other week
- □ Monthly
- □ Less frequently than once per month

20) How did you learn these meetings were occurring?
- □ Radio
- □ Television
- □ Posted notifications
- □ Social Media (facebook, twitter, etc…)
- □ Neighbors, friends or relatives
- □ Local officials
- □ Internet / website
- □ Other: _____

21) How many of these meetings did you attend?
- □ None
- □ 1-5
- □ 6-10
- □ 11+

22) To what extent do you agree with the following statement:

The agenda for the meetings were highly structured with a written agenda containing the specific topics, and an allotted time for each topic.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

23) To what extent do you agree with the following statement:

The meeting was conducted with a formal structure such as Roberts Rules of Order; and had a designated chair person or meeting facilitator.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

24) To what extent do you agree with the following statement:

Attendees were given ample time and opportunity to participate in the meetings. The concerns raised were heard, valued, and acted upon.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

25) To what extent do you agree with the following statement:

Formal minutes of the meeting were compiled and posted and or distributed to attendees.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

26) To what extent do you agree with the following statement:

The meetings were highly efficient and worth my time to attend.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

27) To what extent do you agree with the following statement:

The meetings were an effective tool to distribute information and part of an effective planning process for housing recovery.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

In the next series of questions, consider your overall experience with housing recovery following the floods.

28) To what extent do you agree with the following statement:

I was able to easily navigate the governmental process(es) to complete my permitted work.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

29) To what extent do you agree with the following statement:

Information about planning for housing recovery was readily available from governmental agencies.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

30) To what extent do you agree with the following statement:

I felt government was there to help me through the housing recovery process.

□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

31) To what extent do you agree with the following statement, if you received FBO assistance:

I was able to easily navigate the FBO process(es) to complete my permitted work.

□	□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Not Applicable

32) To what extent do you agree with the following statement, if you received FBO assistance:

Information about planning for housing recovery was readily available from FBOs.

□	□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Not Applicable

33) To what extent do you agree with the following statement:

I felt FBOs were there to help me through the housing recovery process.

□	□	□	□	□	□
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Not Applicable

The next series of questions are about you.

34) What is your gender
- Male
- Female

35) What is your age?

_____

36) What is your marital status?
- Single
- Married
- Divorced
- Widowed

37) What is your highest level of education?
- Less than high school
- High school diploma / GED
- Some college or vocational school
- Bachelor's degree
- Advanced degree (masters or above)

38) What is your race?
- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

39) What is your ethnicity?
- Hispanic or Latino
- Not Hispanic or Latino

40) What is your yearly household income?
- Less than $49,999
- $50,000-$99,999
- $100,000-149,999
- $150,000-$199,999
- More than $200,000

41) Are there other individuals or organizations you believe would have insights and information relevant to this research?

42) Do you have anything else to add related to your experience with recovery planning that would be valuable for this research?

Thank you for your participation in this research

VITA

Kevin O. Milan

Candidate for the Degree of

Doctor of Philosophy

Thesis: THE 2013 FLOODS IN BOULDER COUNTY COLORADO: AN ANALYSIS OF GOVERNMENTAL AND FAITH-BASED ORGANIZATIONS' POST-DISASTER PLANNING FOR HOUSING RECOVERY

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National Fire Protection Association
International Association of Arson Investigators
International Code Council