Walden Dissertations and Doctoral Studies

2017

Perceived Threats to Food Security and Possible Responses Following an Agro-Terrorist Attack

LaMesha Lashal Craft
Walden University

Walden University

College of Social and Behavioral Sciences

This is to certify that the doctoral dissertation by

LaMesha Craft

has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

Review Committee
Dr. Christopher Jones, Committee Chairperson,
Public Policy and Administration Faculty

Dr. Raj Singh, Committee Member,
Public Policy and Administration Faculty

Dr. Paul Rutledge, University Reviewer,
Public Policy and Administration Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
2017

Abstract

Perceived Threats to Food Security and Possible Responses Following an Agro-Terrorist

Attack

by

LaMesha Craft

MA, American Military University, 2012

BS, American Military University, 2007

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy & Administration

Walden University

February 2017

Abstract

The September 11, 2001 terrorist attacks exposed vulnerabilities to U.S. homeland security and defense, leading U.S. officials to analyze threats to domestic and international interests. Terrorist attacks against food and water supplies (agro-terrorism), were deemed a national security threat because of the assessed fear, economic instability, and social instability that could occur following a food shortage. Research indicated a comprehensive response plan does not exist across the federal, state, and local levels of government to mitigate the public's possible responses to a perceived threat to food security and food shortages following an agro-terrorist attack. This ethnographic case study analyzed the perceived threats to food security and the possible responses to food shortages in Yuma, Arizona (the "winter lettuce capitol of the world"). Coleman and Putnam's theories of social capital served as the theoretical framework for this study. Data were collected through semistructured interviews of nine residents and six experts from Yuma's departments of government to examine the relative atmospherics between the citizens and government officials. Findings indicated that a comprehensive plan does not exist, and perceived fears and the lack of knowledge about emergency preparedness in a society with high social capital and community resilience can still create the conditions for chaos and anomie. Recommendations include improving communication, education, and expectation management of citizens. Implications for social change include improving public awareness and individual responsibility for preparedness, as well as assisting policymakers in maintaining social capital to deter social disorganization and anomie during disasters.

Perceived Threats to Food Security and Possible Responses Following an Agro-Terrorist

Attack

by

LaMesha Craft

MA, American Military University, 2012

BS, American Military University, 2012

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Policy & Administration

Walden University

February 2017

Dedication

      I dedicate this academic achievement to my son, Tai I. Craft; my life partner, Mr. Armour W. Taylor III; and my parents, Mamie and Ray Craft. Tai, you have been my motivation because I want you to know that education is yours for the taking. Armour, thank you for being my "cut man," my comic relief, and always reminding me that I "got this!" Mom and Dad, I have learned a lot from you and I appreciate every aspect of my childhood because it has made me resilient, taught me that I can do everything I want to do, and has given me a sense of humor.

Table of Contents

iv

List of Figures

Chapter 1: Introduction to the Study

Introduction

On September 11, 2001, the United States endured a terrorist attack (commonly referred to as 9-11) that undoubtedly changed the economic and social fabric of America. The national concept of terms like homeland security, homeland defense, emergency management, and vulnerability were challenged. The 9-11 attacks exposed vulnerabilities in U.S. policies and procedures for safeguarding its critical infrastructure, defending the homeland, and protecting domestic and international interests. Following 9-11, the U.S. Congress passed several pieces of legislation, and the president issued directives to analyze the threats to U.S. domestic and international interests. Congress passed legislation with the expressed goal of identifying, assessing, and mitigating vulnerabilities that domestic or international terrorists could exploit. For example, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (hereafter referred to as the Bioterrorism Act) sought to mitigate threats to U.S. personnel and interests through the U.S. food supply (Hinrichs, 2013; Pub. L. No 107-188, 2002). Furthermore, within a year of the Bioterrorism Act, former President George W. Bush published several homeland security presidential directives (HSPDs) such as the 2003 Homeland Security Presidential Directive on the Management of Domestic Incidents (HSPD-5), the 2003 Homeland Security Presidential Directive on National Preparedness (HSPD-8), and the 2004 Homeland Security Presidential Directive on the Defense of U.S. Agriculture and Food (HSPD-9).

Homeland Security Presidential Directives 5, 8, and 9 are three prominent pieces of legislation that focused on analyzing threats to U.S. national security and initiating (or improving) coordination and collaboration among government agencies responsible for homeland security (Caudle, 2012; Monke, 2007; Seebeck, 2007; U.S. Department of Homeland Security, 2003a, 2003b, 2004; U.S. GAO, 2005, 2011a, 2015, 2016a, 2016b). The aforementioned threat and vulnerability assessments represented a paradigm shift in the perception of critical infrastructure and the threats against it. Specifically, in HSPD-9, threats to agriculture, namely terrorist attacks against food and water supplies (agro-terrorism), were deemed a national security threat because of the assessed fear, economic instability, and social instability that could occur following the indication of a food shortage (FEMA, 2011; Monke, 2007; Office of the Press Secretary, 2004; Oladosu, Rose, & Lee, 2013; Olson, 2012; Rohn & Erez, 2013; U.S. DHS, 2004; U.S. Government Accountability Office, 2011b). The agriculture and food industry are extremely important to the economic stability of the United States because the agriculture sector includes the farm business, farm-related industries, and agriculture-related industries (Chalk, 2004; Gill, 2015; Jackson, Dixon, & Greenfield, 2007; Monke, 2007; Oladosu et al., 2013; Olson, 2012). In 2014, the aforementioned industries contributed $835 billion to the U.S. gross domestic product (GDP; nearly 1% of the GDP) and approximately 17.3 million full- and part-time jobs (9%) of total U.S. employment (U.S. Department of Agriculture, 2016). In response, the DHS, in conjunction with several federal agencies such as the U.S. Departments of Agriculture (USDA), Health and Human Services (HHS) and the Federal Bureau of Investigations (FBI), established the National Response Framework to

develop standard operating procedures for responding to all types of disasters and emergencies (U.S. DHS, 2013).

Despite threat and vulnerability assessments, legislation, and presidential directives, legislators have not made the threat to agriculture a priority (Monke, 2007; U.S. GAO, 2005, 2011b, 2016a, 2016b). In fact, the government did not add agriculture to the list of critical infrastructure until late 2003 (Monke, 2007). However, since the late 1990s, scholars have identified potential targets of agro-terrorism such as livestock, grains, and produce that could significantly affect food security and the economy (Glick, 2007; Johnson, Herrmann, Wallace, Troutt, & Myint, 2009; Knowles et al., 2005; McGinley, 2002; Monke, 2007; Oladosu et al., 2013; U.S. GAO, 2005). Publications from 2007 to 2013 recommended the improvement or establishment of plans to mitigate an agro-terrorist attack (Federal Emergency Management Agency, 2011; Olson, 2012; Scheider, Schneider, Webb, Hubbard, & Archer, 2009; Seebeck, 2007; U.S. DHS, 2008; U.S. GAO, 2011b). Furthermore, research has indicated that a comprehensive response plan does not exist across the federal, state, and local levels of government to address the threats to food security and the citizens' possible responses to a food shortage. The lack of a plan leaves the U.S. government and its citizens vulnerable. For example, an agro-terrorist attack that threatens food security could impact the social organization, social cohesiveness, and resilience of neighborhood communities in the US (Cafiero, Melgar-Quinonez, Ballard, & Kepple, 2014; FEMA, 2011; Huanping, Huifen, Guoliang, & Ding'an, 2015; Monke, 2007; Office of the Press Secretary, 2004; Olson, 2012; Rohn & Erez, 2013).

Background

In order to appreciate the challenges of responding to a perceived threat to food

security and food shortages following an agro-terrorist attack, there are several themes

that are important to this study: efforts after 9-11 to improve homeland security and

homeland defense, the threat of social disorganization, the significance of community

resilience, the vulnerability of agriculture, and food security.

Efforts After 9-11 to Improve Homeland Security/Homeland Defense

One of the nation's vulnerabilities exposed by 9-11 was the lack of a collaborative

and comprehensive system to deter, mitigate, and respond to large-scale natural and man-

made disasters as a nation. To better understand the plight of current legislation on

homeland security, homeland defense, and national preparedness, it is important to first

chronicle the 15-year efforts to respond to an unprecedented terrorist attack while

simultaneously mitigating future attacks and responding to natural disasters. While this

list is not all-inclusive, an examination of the following legislation demonstrates the

importance of social capital, community resilience, and the whole community approach

in homeland security and homeland defense.

- In June 2002, then President George W. Bush published *Securing the
  Homeland: Strengthening the Nation.* This publication identified homeland
  security as the nation's focus and provided the first national strategy for
  safeguarding the United States against terrorism (Bush, 2002).

- In July 2002, the Office of Homeland Security published the first national
  strategy to protect the homeland in which preventing terrorism, reducing

vulnerabilities to terrorism, and improving emergency management and preparedness were identified as key facets of the nation's strategy for protecting the homeland (Office of Homeland Security, 2002).

- In November 2002, Congress passed the *Homeland Security Act of 2002*, which authorized the Department of Homeland Security and codified the national strategy for homeland security and homeland defense (Pub. L. No 107-296, 2002).

- In February 2003, the HSPD-5 mandated the establishment of the National Incident Management System at the federal, state, and local levels of emergency management to improve efficiency of responding to domestic emergencies. It also mandated the establishment of a national response plan (U.S. DHS, 2003a).

- In December 2003, the HSPD-8 defined national preparedness and mandated a national goal of "all-hazards preparedness," defined as preparedness for domestic terrorist attacks, major disasters, and other emergencies (U.S. DHS, 2003b, para. 1). Establishing tangible readiness priorities and goals was the primary objective of HSPD-8. This legislation called for the establishment of preparedness standards for first responders and their implementation at the state and local level by the end of fiscal year 2005 (U.S. DHS, 2003b).

- In January 2004, HSPD-9 established a national policy to defend the agriculture and food system against terrorist attacks, major disasters, and other emergencies (U.S. DHS, 2004). Although this legislation clearly identified the

criticality of safeguarding agriculture and food, it was arguably overshadowed

by the Hurricane Katrina disaster and the subsequent exposure to many gaps

in the national preparedness framework.

- In August 2006, following the August 2005 Hurricane Katrina–one of the

  deadliest and economically devastating hurricanes in U.S. history (History

  Channel, 2009)--Congress passed the *Post Katrina Emergency Reform Act of

  2006* (PKEMRA). Despite the post-9-11 overhaul of emergency management,

  the Category 3 hurricane highlighted numerous challenges within the

  emergency management and response processes. The magnitude of the

  hurricane and its impact on Louisiana, Mississippi, and Alabama required

  assistance from all 50 states, as emergency management organizations,

  nongovernment organizations, private organizations, and federal assistance

  evacuated and/or relocated 1 million displaced residents (FEMA, 2010). The

  required response effort for Hurricane Katrina was unprecedented and created

  challenges for federal, state, local, and tribal entities (Chamlee-Wright &

  Storr, 2011; Elliott, Haney, & Sams-Abiodun, 2010; Farazmand, 2007; Klitz

  & Ramsay, 2012; Nicholls & Picou, 2013). This led to harsh criticism of

  emergency management and response processes. In an effort to improve

  national preparedness, PKEMRA further streamlined emergency management

  and response procedures. It amended the Homeland Security Act of 2002,

  refined the role of FEMA during and after disasters, and revised the definition

  of emergency management. PKEMRA also added a "protection" phase,

thereby establishing five phases of emergency management: preparation, mitigation, protection, response, and recovery (Caudle, 2012; FEMA, 2010; S.3721, 2006).

- In September 2007, the DHS finalized the national preparedness goals through the publication of the *National Preparedness Guidelines* (U.S. DHS, 2007). In addition to lessons learned from Hurricane Katrina, this publication included four critical elements of national preparedness: the core goals for the nation, the establishment of 15 realistic all-hazards planning scenarios for coordinated training exercises focused on the five phases of emergency management, a universal task list of over 1,600 tasks to provide tangible assessment tools of preparedness, and a target capabilities list that defined 37 capabilities that communities, public and private sectors, and government entities should possess to respond to disasters (U.S. DHS, 2007).

- In March 2011, following the publications of the *Quadrennial Homeland Security Review* (QHSR) *Report* (February 2010) and the *Bottom Up Review* (July 2010) that addressed challenges of homeland security and homeland defense, while providing core mission areas and strategic goals (U.S. DHS, 2010a, 2010b), the Obama administration published Presidential Policy Directive 8 National Preparedness (PPD-8). The PPD-8 replaced HSPD-8, and like the legislation before it, the PPD-8 addressed the need for preparedness. However, it also addressed specific threats and vulnerabilities, while emphasizing that national preparedness is the "shared responsibility of all

levels of government, public and private sectors, and individual citizens"
(U.S. DHS, 2011b, p. 1).

- In September 2011, the first edition of the *National Preparedness Goal* was published, which underlined five core capabilities required to achieve the national preparedness goal. This document emphasized the interdependence of each core capability and how critical individual and community preparedness was to the overall success of national preparedness (U.S. DHS, 2011a).

The 9-11 attacks made the U.S. government reevaluate vulnerabilities in homeland security and homeland defense. The majority of the actions taken were in response to the post-9-11 criticism of limited interagency collaboration and coordination. In turn, the U.S. government drafted and/or implemented legislation intended to improve interagency collaboration and coordination, demonstrate the criticality of community involvement in emergency management, and emphasize the importance of citizens taking a vested interest in their community. While the legislation over the last 15 years has identified deficiencies of federal, state, and local government plans for homeland security and homeland defense, it has failed to establish tangible solutions (U.S. GAO, 2015, 2016a, 2016b). Arguably, the average American is no closer to understanding their shared responsibility for national preparedness or their role in maintaining social organization during a large-scale disaster. As observed in the Hurricane Katrina emergency management and response efforts as well as the lack of preparedness among the citizens of Louisiana, this lack of understanding can severely degrade social organization and stability.

The Threat of Social Disorganization

In 1897, Durkheim introduced the concept of anomie (social instability that occurs after standards and values break down in society; Durkheim, 1984). Merton (1968) later expanded on Durkheim's findings (Zembroski, 2011); he discovered that most cases of anomie occur when the population does not develop a sense of cultural meaning and societal integration. This is also known as relative deprivation (Kawachi, Kennedy, & Wilkinson, 1999; Zembroski, 2011). Theories of relative deprivation (Merton, 1968) and social disorganization (Sampson & Groves, 1989; Shaw & McKay, 1972) suggested that when there is a significant disparity between communal values, standards, and wellbeing, the possibility of social instability (anomie) exists, and those conditions could lead to social disorganization.

Kawachi et al. (1999) drew parallels between these theories and crime rates; they argued that social characteristics, such as the degree of relative deprivation in society and the degree of social cohesiveness among citizens, can influence the level of crime. Furthermore, Kawachi et al. asserted that crime is a social mirror and can indicate the degree of social relations in society. In that same vein, the potential threat of social instability should be viewed in the context of social (i.e., networks, norms, and trust) and cultural (i.e., values and beliefs) capital (Smith & Lawrence, 2014). The combination of social and cultural capital constitutes social capital theory, which facilitates the examination and analysis of a community's capacity to respond to and recover from an adverse event (community resilience).

The Significance of Community Resilience

Community resilience enables communities to respond and adapt to adversity or a change in conditions (Hyvarinen & Vos, 2015; Kulig, Edge, Townshend, Lightfoot, & Reimer, 2013; Leykin, Lahad, Cohen, Goldberg, & Aharonson-Daniel, 2016; Linnell, 2014; Plodinec, Edwards, & White, 2014; Smith & Lawrence, 2014; U.S. Department of Health and Human Services [U.S. HHS], 2012). Resilience is paramount for communities to effectively care for themselves in both routine and emergency situations. Enhanced resilience is considered critical to mitigating vulnerabilities, reducing negative health consequences, and rapidly restoring the functionality of the community following a crisis or disaster (FEMA, 2009; Kulig et al., 2013; Lee, 2010; Plodenic, Edwards, & White, 2014; Smith & Lawrence, 2014; U.S. HHS, 2012). Moreover, the concept of community resilience is one of the cornerstones to the *whole community approach* cited in the 2014 QHSR report and the National Preparedness Framework (U.S. DHS, 2013, 2014a). Over the last decade, scholars have examined the usefulness of community resilience in understanding and mitigating disaster situations (Aldrich & Meyer, 2015; Chen, Chen, Vertinsky, Yumagulova, & Park, 2013; Kulig et al., 2013; Kulig et al., 2011; Plodenic et al., 2014; Smith & Lawrence, 2014). Presidential Policy Directive-8 (National Preparedness) noted that improving societal resilience against acts of terrorism and natural disasters would require raising the level of public awareness to motivate individuals to assume personal responsibility for preparedness (U.S. DHS, 2011b).

The Vulnerability of Agriculture

Despite the lack of large-scale attacks against agriculture, it remains vulnerable due to the economic and social significance of an agro-terrorist attack (Hinrichs, 2013; Moats, 2007; Monke, 2007; Office of the Press Secretary, 2004; Oladosu et al., 2013; Olson, 2012; Rohn & Erez, 2013; U.S. DHS, 2004; U.S. GAO, 2005, 2011b; Yeh, Lee, Park, Cho, & Cho, 2012). In spite of directives, policies, and frameworks, the DHS and USDA do not have a comprehensive, coordinated, and tested strategy that effectively identifies and safeguards agriculture against an agro-terrorist attack. Publications from 2007 to 2016 indicated that food security remains a vulnerability and threat to U.S. national security. Much of the literature recommended improving or establishing robust plans to mitigate an agro-terrorist attack (FEMA, 2009; Hinrichs, 2013; Moats, 2007; Olson, 2012; Seebeck, 2007; Schneider, Schneider, Webb, Hubbard, & Archer, 2009; U.S. DHS, 2008; U.S. GAO, 2011b). Additionally, literature during this period indicated a comprehensive federal, state, and local emergency management plan to respond to an agro-terrorist attack was nonexistent (Johnson et al., 2009; Olson, 2012; Schneider et al., 2009; U.S. DHS, 2008; U.S. GAO, 2011b).

Food Security

Food security is a major requirement for the physical and emotional wellbeing of all people. Having access to dietary needs and nutritious food enables healthy living (Food and Agriculture Organization, 2014; World Health Organization, 2014). The state of food security is built on three pillars: food availability, food access, and food use (WHO, 2014). A food shortage occurs when people do not have the means to purchase or

produce enough food to sustain their families and food supplies in the region are not available (United Nations University, 2013). Large-scale incidents and man-made attacks on agricultural resources or the food supply are considered high food security risks that can potentially affect socioeconomic and public health systems (Hinrichs, 2013; Johnson et al., 2009; Oladosu et al., 2013; Olson, 2012; Yeh et al., 2012).

Problem Statement

The specific problem that this study addressed is the lack of federal, state, or local government plans to mitigate the public's possible responses to a perceived threat to food security and possible food shortages following an agro-terrorist attack. The lack of plans and the perceived threat to food security could be catalysts to social disorganization due to the lack of social capital and community resilience. Theories of relative deprivation (Merton, 1968) and social disorganization (Sampson & Groves, 1989) suggest that when there is a significant disparity between communal values, standards, and wellbeing, the possibility of social instability (anomie) exists.

Purpose of the Study

The purpose of this ethnographic case study was to examine, describe, and analyze the perceived threats to food security and the possible responses to food shortages in an agricultural community in Arizona (specifically Yuma, Arizona). This was based on a hypothetical agro-terrorist attack on the U.S. food supply.

Yuma is located in the southwest corner of Arizona and shares 126 miles of the US-Mexico border (U.S. Customs and Border Protection, 2014). Yuma, Arizona is agriculturally significant because it is considered the "winter lettuce capitol of the

world," and grows over 175 different crops including fruit, wheat, cattle, and Medjools dates. Ninety percent of all leafy vegetables grown in the United States during the winter months (November-March) come from in/around Yuma County, Arizona. The agriculture industry in Yuma County represents more than one-third ($3.2 billion) of Arizona's annual gross economic return ($9.2 billion); furthermore, Yuma's vegetable production ranks between first in the state and third in the nation (Yuma Visitors Bureau, 2014). Yuma County is home to 11 salad plants that produce bagged lettuce and salad mixes, with each plant producing over 2 million pounds of lettuce per day during peak production months.

Yuma has a year-round population of approximately 200,000 residents. During the winter, the population increases by about 90,000 due to the U.S. citizens seeking the warm winter weather of Yuma, Arizona (Yuma County, 2014). Yuma is also home to the U.S. Army Yuma Proving Ground, one of the largest military installations in the western world that is responsible for testing U.S. Army weapons systems and equipment (U.S. Army Yuma Proving Ground, 2014). The agricultural, economic, and strategic importance of Yuma, Arizona suggests that it represents the kind of environment that would be favorable to agro-terrorists seeking to cause economic devastation within the US, exploit a weakness to the U.S. security apparatus, and discredit the government.

Research Questions

The intent of this study was to explore the possible responses to a perceived threat to food security and possible food shortages following an agro-terrorist attack. The following research questions were used to frame this study:

Central Research Question

What are the perceived threats to food security in an agricultural community in Arizona and the possible responses to food shortages to a hypothetical agro-terrorist attack on the U.S. food supply?

Subquestions

1. To what extent do the citizens of Yuma, Arizona believe their local government can provide assistance when a threat to food security exists?

2. To what extent does community resilience in a community within Yuma, Arizona affect possible responses to food shortages?

Theoretical Framework

The theoretical framework for this study focused on the social capital theory as defined by Coleman (1988, 1990) and Putnam (1995, 2000). Social capital exists in societies where individuals recognize the mutual benefit of developing social networks and working collectively towards shared goals (Coleman, 1990; Putnam as cited in Kawachi et al., 1999). The lack of social capital is one of the primary features of socially disorganized communities (Sampson as cited in Kawachi et al., 1999).

Coleman (1988) focused on how social capital and social structures of relationships could be actualized into tangible resources for use by individuals. Putnam (1995, 2000) popularized the concept of social networks by emphasizing the role of social capital in generating benefits beyond individuals at the neighborhood and community level. I used the social capital theory to examine the complexity of human reactions to the threat to food security and the possibility of a food shortage. The threat to

food security could cause fear, uncertainty, and lack of trust among the citizens of Yuma, Arizona. This fear and lack of trust could manifest itself through social disorganization following the real or perceived threat to food security, caused by an agro-terrorist attack on the U.S. food supply.

Nature of the Study

The nature of this study was an applied qualitative ethnographic case study. I considered using an ethnographic study, a phenomenological study, and an ethnographic case study. I did not select an ethnographic study because such studies require the researcher to play an integral role in the research by observing individuals in their natural location and relying more heavily on firsthand observations than a case study (Patton, 2002). Moreover, ethnography makes the central assumption that any human group of people interacting together will establish a culture (Patton, 2002). In this study, I did not assume that a community in Yuma, Arizona had an established culture. While phenomenology is one of the primary research approaches for a qualitative study, I did not chose a phenomenological study because phenomenology is the process of studying phenomena that exists in a community, neighborhood, or part of the world (Patton, 2002), and this research topic required the participants to anticipate and describe their most likely reactions to a hypothetical event that has not occurred.

Given the complexity of the research topic, the ethnographic case study approach was appropriate because it allowed me to exploit a "hybrid reality" as described by Denzin and Lincoln (2005, p. xvi). This approach enabled me to develop a greater understanding of the participants' experience (ethnography) with community resilience

while conducting in-depth explorations (case study) of possible reactions to a food

shortage after an agro-terrorist attack and the potential effects on society. Furthermore, an

ethnographic case study is narrowly focused on individuals' experiences and depth of

meaning relative to their respective understandings of the case, bounded by local,

organizational, and social contexts (Franklin, 2010). Lastly, this methodology facilitated

the identification of unanticipated responses by participants while analyzing interrelated

influences that enable events to take place (Denzin & Lincoln, 2005).

Definitions of Key Concepts

Anomie theory: Durkheim introduced the concept of anomie (social instability

that occurs after standards and values break down in society) in 1897. Merton (1968)

later expanded on Durkheim's findings (Zembroski, 2011); he discovered that most cases

of anomie occur when the population does not develop a sense of cultural meaning and

societal integration (relative deprivation; Kawachi et al., 1999; Zembroski, 2011).

Agro-terrorism: A subset of bioterrorism, agro-terrorism is the "deliberate

introduction of an animal or plant disease for the purpose of generating fear, causing

economic losses or undermining social stability" (Monke, 2007, p. 1).

Biosecurity: Biosecurity is the protection of agricultural animals from any type of

infectious agent--viral, bacterial, fungal, or parasitic (U.S. Environmental Protection

Agency, 2012).

Community resilience: Resilience is defined as the ability to resist, absorb, and

recover from or successfully adapt to adversity or a change in conditions (U.S.

Department of Health and Human Services, 2012). Therefore, community resilience is

defined as the ability of communities to resist, absorb, and recover from, or successfully adapt to, adversity or a change in conditions. Consequently, the public's individual and collective efforts to enhance community resilience are understood as the ambition to maintain and strengthen societal security (Hyvarinen & Vos, 2015; Linnell, 2014; Plodinec et al., 2014).

Food security: Food security "exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 2014, para. 1; WHO, 2014).

Food shortage: A food shortage occurs when people cannot grow or buy enough food to feed their families and the food supplies within a bounded region do not provide the energy and nutrients needed by that region's population (United Nations University, 2013).

Homeland security enterprise: As noted in the first and second QHSR, homeland security is considered a "widely distributed and diverse national enterprise." The term enterprise refers to "efforts and shared responsibilities of federal, state, local, tribal, territorial, nongovernmental, and private-sector partners – as well as individuals, families, and communities" (U.S. DHS, 2010b, p. ii).

Social capital: Defined by its principal theorists (Coleman, 1990; Putnam, 1995) as those features of social organization, such as networks, norms of reciprocity, and trust in others, which facilitate cooperation between citizens for mutual benefit. Lack of social capital is one of the primary features of socially disorganized communities (Sampson & Groves, 1989).

Social cohesion: In the literature, *socially cohesive* has been used to describe communities that are high in stocks of social capital and low in social disorganization, with strong levels of collective efficacy (Kawachi & Kennedy as cited in Kawachi et al., 1999; Wilkinson, 1996). Although no single definition exists, it is important to note that social capital and social cohesion are not the same. For example, gangs may provide social capital to its members without contributing to the level of social cohesion in a community (Kawachi et al., 1999, p. 730).

Social disorganization: Defined as the "inability of a community structure to realize the common values of its residents and maintain effective social controls" (Kawachi et al., 1999, p. 729).

Assumptions

There were several assumptions in this research study. I assumed that residents in Yuma, Arizona had an interest in the threats to food security and a food shortage because agriculture plays a significant role in the city's economy. I also assumed that my target audience would voluntarily participate in the research and that the residents of a community were open to answering questions about their community dynamics. Furthermore, I assumed that employees of the Department of Agriculture and leaders of the emergency management and police departments had an interest in the research topic and would openly discuss the research problem and any deficiencies in preparation for large-scale disasters like agro-terrorism. Lastly, I assumed the participants would answer the interview questions honestly.

Scope and Delimitations

The research included interviews, the use of government documents, and the use of archival data. Qualitative research is consistent with examining how the social capital theory can be used to examine the perceived threats of food security among citizens within a community of Yuma, Arizona as well as their possible responses to food shortages following a hypothetical agro-terrorist attack on the U.S. food supply.

In this study, I focused on a community within Yuma, Arizona. The selection of the community was based on (a) agricultural relevance, (b) population, and (c) diversity of the population. I used archival data and government documents from state records to determine the agricultural relevance, the population, and the diversity of the population within the communities in Yuma, Arizona. I initially planned to interview 10 to 15 individuals within one community, a member of the Yuma Police Department, the Yuma Emergency Management Department, the Yuma Fire Department, and the Yuma U.S. Agricultural Department using open-ended questions. I used a variety of data sources such as media reports, government reports, and the official minutes of legislative meetings, which helped contextualize and triangulate the study. The data sources helped determine the perceived relationship between the population and law enforcement within the community prior to conducting interviews of local citizens.

I was able to interview to nine residents of Yuma, Arizona as well as six experts, including Yuma's Fire Department, Sheriff's Office, the County Emergency Management Office, Yuma County Public Health Services, and the Police Department. The aforementioned delimitation impacted the study because the thoughts and beliefs of

nine individuals and six experts may not reflect the opinions of the entire of population. Another delimitation of this study was the notion of asking participants to reflect on an event that had not occurred.

Limitations

This study was limited to the perspective of residents and experts of Yuma, Arizona. Citizens residing in other agriculturally significant areas within the United States (and abroad) may offer disparate views regarding the perceived threat to food security and possible food shortages following a hypothetical agro-terrorist attack.

Significance

This study is significant because it has the potential to effect social change in multiple ways. It may address an underresearched element of homeland security and threats to agriculture that could assist government and emergency management officials at the federal, state, and local levels. The results of this study may assist government officials of Yuma, Arizona to determine its unique challenges in maintaining social organization following an agro-terrorist attack and the threat to food security. Examining the potential impacts to a community's resilience and its possible responses to food shortages may improve emergency management and preparedness at the local and state level. Additionally, the results may assist local government officials of Yuma, Arizona in understanding the average citizen's expectations of government assistance following an agro-terrorist attack or large-scale disasters in general. Understanding and managing citizens' expectations of government officials could deter social disorganization following an agro-terrorist attack. Furthermore, insights from this study could enable

well-developed food security plans that involve the whole community approach and
improve the overall social capital within Yuma, Arizona. Lastly, the results could serve
as a reference for future studies of other states, cities, and/or communities that may be
susceptible to social disorganization following a large-scale disaster that threatens food
security.

Summary

This chapter provided an introduction to the study, a review of the background to
include key concepts, the purpose of this study, the problem statement, research
questions, the theoretical framework, and the nature of the research. The 9-11 terrorist
attacks created a paradigm shift in the concept of homeland security and homeland
defense. The attacks exposed the inherent challenges and vulnerabilities within defending
the homeland, emergency management, and maintaining social organization following a
large-scale natural or man-made disaster. As noted in the aforementioned legislation
passed after 9-11, building resilient communities and employing the whole community
approach is paramount in creating the most effective means of mitigating and responding
to large-scale disasters, especially those that may threaten basic needs such as food
security.

The intent of this study was to discuss the lack of federal, state, or local
government plans to mitigate the public's possible responsible to a perceived threat to
food security and possible food shortages following an agro-terrorist attack. In this
ethnographic case study, I explored potential responses to a hypothetical agro-terrorist
attack that threatens food security and possible food shortages by examining to what

extent the citizens of Yuma, Arizona believe their local government can provide assistance, and how the level of community resilience may affect responses to a food shortage. In essence, this study addressed an important, yet underresearched threat to U.S. national security. This was accomplished using interviews of select citizens, government officials, and emergency management professionals of Yuma, Arizona. The next chapter provides a comprehensive examination of the literature relevant to this research topic.

Chapter 2: Literature Review

Introduction

The central research question for this study is the following: What are the perceived threats to food security in an agricultural community in Arizona and the possible responses to food shortages to a hypothetical agro-terrorist attack on the U.S. food supply? Inherent in this research question are several key concepts that must be explored to gain a comprehensive understanding of the research problem: social capital theory, community resilience, the whole community approach, agro-terrorism, and food security.

Literature on social capital theory, community resilience, the whole community approach, agro-terrorism, food security, and food shortage was obtained through reviewing academic databases including PsycINFO, ProQuest Central, Political Science Complete, SAGE Premier, Thoreau Multi-Database, Google Scholar, and the Homeland Security Digital Library. Key words included *agro-terrorism*, *bioterrorism*, *anomie*, *social disorganization*, *social capital*, *community resilience*, *Hurricane Katrina*, *whole community*, *food security*, *food shortage*, and *relative deprivation*. There were over 2,500 results generated from using these search engines. The majority of literature on community resilience, the whole community approach, and agro-terrorism was published after the 9-11 terrorist attacks. However, theorists and scholars have long explored social capital theory, food security, and food shortage. The abundance of literature on social capital theory provides healthy debate on the origins, complexity, and implications of social capital in society. In turn, the future of food security and the dangers of food

shortages continue to kindle debates within academia. This literature review provides discourse on social capital theory, community resilience, the whole community approach, agro-terrorism, and food security/food shortage.

Social Capital Theory

Based on Harbeck's (2009) perspective of key points from the social disorganization theory, the success of the neighborhood/community, and subsequently how well it functions, is based on how the neighborhood/community effectively uses its resources. In this case, the term *resource* is all-inclusive to include skills, resources, focus, and energy to solve problems and improve/maintain quality of life. Early debates on social disorganization theory discussed the status, ability, and functionality of the community with specific reference to race and family structure (Sampson & Groves, 1989; Shaw & McKay, 1972). However, when discussions of race and family structure are stripped away, the theorists are essentially measuring the disparity within the community's ability to employ its available resources. The most basic definition of social capital revolves around the "many informal, interdependent networks that help a community or individual function effectively and achieve its goals" (Harbeck, 2009, n.p.). While I did not explore this definition of social capital, it is worth noting that in its simplest form, social capital revolves around networks that can help (or hurt) the functionality of individuals and communities. In that vein, a brief discussion of Durkheim's (1984) anomie theory, Merton's (1968) relative deprivation theory, and Sampson and Groves's (1989) social disorganization theory is warranted.

In Theory: Anomie

Durkheim (1984) and Merton (1968) shared the belief that as societal bonds breakdown, a decline of common rules and values will follow, and society will become unstable and full of confusion and ultimately conflict. Durkheim defined this state of normlessness as *anomie*. Merton attempted to establish a framework to provide a systematic approach to analyze how "social structures exert a definite pressure upon certain persons in the society to engage in nonconforming rather than conforming conduct" (Merton, 1968, p. 132). Merton argued that Durkheim's theory of anomie occurs once the society succumbs to deviant behavior, thereby making it unstable. When studying social and cultural sources of deviant behavior, Merton developed five modes of adaptation that a person may choose when dealing with the pressures of society: conformity, innovation, ritualism, retreatism, and rebellion (p. 140).

- Conformity to cultural goals (e.g., wealth, education, and power) and institutionalized means (e.g., governance and the law) is the most common adaptation in a society that is stable, and a general consensus exists among the majority of society.

- Innovation occurs when an individual generally accepts the goals of society (e.g., wealth, education, power, and influence) but rejects or lacks the socially legitimate means of achieving them.

- Ritualism involves the acceptance of the moral mandates (e.g., a lifestyle of hard work and education) but rejects the cultural goals of attaining wealth, power, and influence.

- Retreatism occurs when an individual rejects both the cultural goals and institutional means. This adaptation is the polar opposite of conformity and the least common mode of adaptation. Individuals that adapt the retreatism mode are likely outcasts of society (e.g., drug addicts, criminals, and/or misfits).

- Rebellion involves the rejection of culturally defined goals and institutionalized means, and the introduction of a new social structure. For example, a rebel may become an activist for social justice and equality to counter the goal of individual wealth and social class systems (Merton, 1968).

Conformity and rebellion represent the opposite ends of the spectrum within Merton's framework of adaptation. In a situation where society has lost faith in the governing faction and the generally accepted way of life, rebellion occurs. Within rebellions exist the possibility of creating an improved means of living (such as improving tacit government corruption) or anomie. For example, citizens of an agriculturally significant city who experience an agro-terrorist attack and are subsequently disappointed by the response of government officials may become rebellious. In a community with high social capital, some citizens may attempt to establish a system to improve government efforts. However, in a community where social capital is low or nonexistent, anomie may occur.

The challenge: Establishing empirical research of anomie. Merton (1968) identified the lack of established indicators of anomie and the subsequent challenges of conducting empirical research. According to Merton, social scientist Srole (1956)

attempted to develop a scale of anomie using metrics that focused on an individual's perception of his/her social environment. Five items established the preliminary scale: (a) the perception that community leaders are indifferent to one's needs, (b) the perception that little can be accomplished in the society that is seen as unpredictable and lacking order, (c) the perception that life-goals are receding rather than being realized, (d) a sense of futility, and (e) the conviction that one cannot count on personal associates for social and psychological support (Merton, 1968, p. 164).

In essence, Srole (1956) sought to identify three dimensions of an individual's sense of anomie (which he referred to as *anomia*): the deflation of moral guidelines, the destabilization of interpersonal supports, and the abandonment of striving for future goals. Srole acknowledged the limitations and inadequacies in the aforementioned *scale of anomie*. However, Merton (1968) viewed this attempt as a marked step towards standardizing anomie. Moreover, a review of individual and community responses by Hurricane Katrina survivors (Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Hausman, Hanlon, & Seals, 2007; Hawkins & Maurer, 2010; Kemmelmeier, Broadus, & Padilla, 2008; Nicholls & Picou, 2013; Teasdale, Stephens, Sloboda, Stephens, & Grey, 2013) indicated Srole's attempt to standardize perceptions of anomie might have been successful.

In Theory: Relative Deprivation

Relative deprivation refers to group reference theory in which we compare ourselves (and our social situations) to individuals that belong to other groups. This mode of comparison forms the basis for the rationalization of situation and behavior (Merton,

1968). One's sense of relative deprivation leads to resentment--the sense that others' gains are somehow based upon or result in our losses. Resentment could, in turn, result in the formation of a counter-cultural orientation based upon reversal of normal cultural goals and social institutionalized means (Merton, 1968). Kawachi et al. (1999) argued that social characteristics, such as the degree of relative deprivation in society and the degree of social cohesiveness among citizens, could influence the level of crime. Furthermore, Sampson and Groves (1989) concluded that communities with sparse social and communal networks were more susceptible to low organizational participation and potentially high rates of crime and delinquency in an environment where social institutions have begun to fail. The findings of the aforementioned theorists are important when researching the potential reactions to food insecurity following an agro-terrorist attack and the impacts that a real or perceived food shortage could have on the degrees of relative deprivation and social cohesiveness.

Social Capital Theory

For decades, individuals within communities have been the stopgap between professional emergency responders and government officials during catastrophic events (Canton, 2007; Shannon, 2015). The role that members of a community assume during and after a disaster is paramount to efficient emergency response (Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Harris, 2014; Hausman et al., 2007; Hyvarinen & Vos, 2015; Plodenic et al., 2014; Reininger et al., 2013; Shannon, 2015). The national response framework notes that homeland security is a national enterprise that requires the collaborative efforts of federal, state, local, tribal, territorial, nongovernmental, private-

sector partners, individuals, families, and communities (FEMA, 2008; U.S. DHS, 2010b, 2013). The framework, along with other publications such as FEMA's *A Whole Community Approach to Emergency Management*, has identified a connection between social capital, community resilience, and disaster preparedness and response (FEMA, 2011; Plodenic et al., 2014). However, this connection has not been fully embraced by some practitioners of disaster planning and management (Aldrich, 2010; Aldrich & Meyer, 2015; Wisner, 2003). Part of the reluctance stems from scholars' inability to agree on which definition and application of social capital best supports the concept of community resilience (Aldrich & Meyer, 2015). The following examination of social capital theory identifies how this particular theory enabled me to explore the research problem.

The history of social capital theory. Hanifan (1916) identified social capital as good will, fellowship, mutual sympathy, and social intercourse among a group of individuals and families that make up a social unit. Bourdieu (1985) defined social capital as one of four types of capital (along with economic, cultural, and symbolic), which collectively determine social life trajectories. In turn, Coleman (1988) and Lin (1999) drew on Bourdieu's definition to focus on the effect of social capital for individual outcomes. Bourdieu (1984, 1985) described social capital as an asset that individuals gain through the procurement of resources within social networks, while Coleman viewed social capital as a resource in the form of mutual trust, the sharing and dissemination of information, and the representation of effective social norms (Chamlee-Wright & Storr, 2011).

As the concept of social capital theory developed, scholars often discussed three types of social capital: *bonding*, *bridging*, and *linking* (Elliott et al., 2010; Hawkins & Maurer, 2010; Norris, Stevens, Pfefferbaum, Wyche, & Pfefferbaum, 2008; Putnam, 2000; Rostila, 2011). Bonding social capital describes cooperative and trusting relationships between members of a network (usually a homogeneous group) such as a community or network. Typically, these networks have shared identities and are inward-oriented. In contrast, bridging social capital describes an outward-oriented network of individuals that recognize their diversity (e.g., age, race, ethnicity, education, and possibly socioeconomic status). Lastly, linking social capital describes the extent to which individuals build relationships with organizations, institutions, and individuals who yield power and influence (Hawkins & Maurer, 2010; Rostila, 2011). While I researched bonding social capital within a neighborhood community, it is important to note that before, during, and after disasters, all three types of social capital are likely to influence the environment (Aldrich & Meyer, 2015; Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Hausman et al., 2007; Reininger et al., 2013).

In addition to providing the intellectual lineage of the social capital theory, Aldrich and Meyer (2015) discussed the current challenges in highlighting the importance of social capital and resilience and the failure of scholars to agree on a robust and objective means to empirically study social capital. For example, Young (2014) conceptualized social capital as having three parts: cognitive elements (e.g., trust, community solidarity, and norms), structural elements (e.g., group membership and diversity), and collective action (e.g., political activity and volunteerism). This is very

similar to Aldrich and Meyer's discussion regarding attitudinal and cognitive aspects (e.g., the perceived trust of groups, government officials, agencies, first responders, and neighbors) as well as behavioral aspects (e.g., volunteer hours, memberships in associations, and familiarity with neighbors). Inherent in the social capital theory as described by the aforementioned scholars is the notion of social trust (Aldrich & Meyer, 2015; Chamlee-Wright & Storr, 2011; Coleman, 1988; Hanifan, 1916; Kawachi et al., 1999; Lin, 1999; McCrea, Walton, & Leonard, 2014; Putnam, 2000; Rostila, 2011; Rothstein, 2013).

Social trust. Empirically, social trust correlates with individuals who believe that most people within their society can be trusted, which in turn means that the same individuals are more inclined to have a positive outlook on government institutions and their influence on their lives, to be tolerant of other ethnicities, and to participate in politics (Reininger et al., 2013; Rothstein, 2013). Additionally, at the societal level, more trusting people equate to greater economic growth, to less crime, and to less corruption (Glanville, Andersson, & Paxton, 2013; Reninger et al., 2013; Rothstein, 2013; Sampson & Groves, 1989). Furthermore, building on its importance to individual and societal structure, the existence of social trust is a cornerstone to formal institutions that establish or improve the rule of law, civil services, and public administration (Rothstein, 2013) because social trust is often linked to political and legal institutions widely accepted by the society (FEMA, 2011; Rothstein, 2013; U.S. DHS, 2014a). In other words, in environments where corruption is low and the quality of government is high, there is a high level of social trust.

Moreover, at the individual level, social connections establish informal and formal ties that encourage the development of generalized trust within a neighborhood/community (Glanville et al., 2013; Reininger et al., 2013; Rothstein, 2013). The development of trust is the basis for establishing community resilience. Informal social connections include interactions with friends, neighbors, family, members of groups, and associates. Scholars have hypothesized that the aforementioned ties foster the development of generalized trust because said relationships enable individuals to form expectations of goodwill (Glanville et al., 2013). Holistically, informal and/or formal social interactions can increase or revise one's estimates of the general trustworthiness of other persons (Glanville et al., 2013; Reininger et al., 2013; Rothstein, 2013).

The potentially negative aspects of social capital. While there are undoubtedly positive attributes to social capital and the term (and theory) often elicits positive connotations, it is important to note that scholars critical of social capital theory make several pertinent arguments. First, the levels of social capital existent in individuals and communities depend on the volume of economic and cultural social capital (Chamlee-Wright & Storr, 2010; Rostila, 2011). In other words, social capital is dependent on the outward-oriented networks available to individuals and communities. Additionally, living in disadvantaged neighborhoods where there are limited personal networks and the quality of social capital is substandard will inherently limit the benefits of social capital (Elliott et al., 2010). Lastly, social capital may promote unhealthy norms and behaviors such as criminality (Putnam, 2000), preservation of social exclusion (Hawkins & Maurer, 2010; Portes, 1998), and inequality of resources between social groups (Elliott et al.,

2010; Rostila, 2011). Examples of closed social structures include totalitarian organizations or countries, religious and ideological community-based sects, highly segregated neighborhoods, and criminal organizations and networks (Rostila, 2011).

Social capital and emergency preparedness. The overall level of emergency preparedness is the responsibility of both emergency managers/planners and every citizen (Gierlach, Belsher, & Beutler, 2010; Gin, Stein, Heslin, & Dobalian, 2014; U.S. DHS, 2011a, 2011b). Despite the 9/11 terrorist attacks and natural disasters, such as Hurricanes Katrina and Sandy, the overall preparedness of communities has not significantly increased according to national surveys conducted between 2007 and 2012 (Gin et al., 2014). This is likely because the average American's perception of their future exposure to natural or man-made disasters continues to run contrary to the actual potential exposure to danger (Gierlach et al., 2010). In contrast, the importance of a community's perspective on their overall preparedness for emergencies and their levels of social trust gained more attention by scholars and government officials after the 2005 Hurricane Katrina disaster (Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Hausman et al., 2007; S.3721, 2006; U.S. DHS, 2007, 2010a, 2010b, 2011b). In essence, high levels of social capital within communities enable strong social networks and the dissemination of information before, during, and after disasters (Aldrich & Meyer, 2015; Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Hausman et al., 2007; Hyvarinen & Vos, 2015; Reininger et al., 2013).

Community Resilience

The dynamics of community resilience is related to emergency preparedness and social capital. The U.S. Department of Health and Human Services (2012) defined resilience as the ability to resist, absorb, and recover from or successfully adapt to adversity or a change in conditions. Community resilience is the ability of communities to resist, absorb, and recover from (or successfully adapt to) adversity or a change in conditions (Kulig, Edge, Townshend, Lightfoot, & Reimer, 2013; Linnell, 2014; Smith & Lawrence, 2014; U.S. HHS, 2012). Consequently, the public's individual and collective efforts to enhance community resilience are understood as the ambition to maintain and strengthen societal security (Linnell, 2014). Given the dynamics between social trust and community resilience, strong community bonds may improve the overall strength of the community and decrease the likelihood of social disorganization following the real or perceived threat of food insecurity.

Between the late 1990s and 2010 several studies focused on generating information and building social models describing the resiliency process (Brown & Kulig, 1996/7; Kulig, 1999; Kulig, Edge, & Joyce, 2008). These studies focused on the relationship between economic recessions and its effect on community resilience such as the loss or damage of natural resources in communities that are economically dependent on said resources. Nevertheless, most of the aforementioned studies demonstrated theoretical and methodological challenges to defining, identifying, and measuring the levels of individual and community resilience. This was most likely because resiliency is dynamic and inevitably changes over time, which suggests that measuring community

resilience requires the study of responses to stress over time. Moreover, it may be difficult to identify when and how indicators of resilience (e.g., social capital, natural resources, and a sense of community) influence the level of community resilience.

The threat of social unrest and social disorganization are rarely addressed as a real and prominent threat to homeland security during discussions about the importance of homeland security and homeland defense, safeguarding critical infrastructure, improving emergency management and response procedures, and the whole community approach. However, improved community resilience may serve as a long-term deterrence of attacks from terrorist groups and lone wolves intended to discredit the government and social networks writ large. Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum (2008) conducted a thorough examination of community resilience with a focus on the utility and applicability of resilience to disaster readiness. They conceptualized community resilience as a set of capacities: economic development, social capital, information and communication, and community competence to describe the conditions that exist in a community that is resilient.

Economic Development and Community Resilience

Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum's (2008) argument on economic development's relationship to community resilience is similar to the previous discussion on linking social capital. Linking social capital focuses on the relationships between organizations and individuals based on power and influence, which can also involve how stakeholders view economic development (Elliott, Haney, & Sams-Abiodun, 2010; Hawkins & Maurer, 2010; Norris et al., 2008; Putnam, 2000; Rostila, 2011). In

other words, the livelihood of communities and their access to diverse resources are closely related to the availability of various assets such as housing, health care, high performing schools, and employment opportunities (Aldrich & Meyer, 2015; Norris et al., 2008). Furthermore, economically challenged neighborhoods and communities are at greater risk for weakened community resilience and possibly death and destruction during and after disasters (Chamlee-Wright & Storr, 2011; Kemmelmeier et al., 2008; Nicholls & Picou, 2013; Norris et al., 2008; Reininger et al., 2013).

Social Capital, Communication, and Community Resilience

Social capital and community resilience have been named as key components for stable communities capable of responding to and recovering from natural and man-made disasters (Aldrich & Meyer, 2015; Brose, 2015; Chamlee-Wright & Storr, 2009; Coleman, 1990; Hyvarinen & Vos, 2015; Kulig et al., 2013; Linnell, 2014; McCrea et al., 2014; Meesters, Olthof, & Van de Walle, 2014; Norris et al., 2008; Plodenic, Edwards, & White, 2014; Putnam, 1995). Furthermore, scholars cite a deficit in social capital as possible explanations for the inability of New Orleans, as a whole, to quickly recover from the 2005 Hurricane Katrina (Aldrich, 2010; Aldrich & Meyer, 2015; Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Farazmand, 2007; Hawkins & Maurer, 2010; Kemmelmeier et al., 2008; Linnell, 2014). In the case of Hurricane Katrina, the presence of social trust and social networks directly correlated to the existence of community recovery and redevelopment, because the networks and social resources readily available following a disaster directly affects the response and recovery phases of emergency management (Aldrich, 2010; Aldrich & Meyer, 2015; Brose, 2015; Canton, 2007;

Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Farazmand, 2007; Glanville et al., 2013; Hawkins & Maurer, 2010; Kemmelmeier et al., 2008).

Additionally, communities that trust one another and have established social networks tend to communicate more frequently and share viable information (Aldrich & Meyer, 2015; Hawkins & Maurer, 2010; Hyvarinen & Vos, 2015; Kemmelmeier et al., 2008). Communication and subsequently the dissemination of information are vital in emergency management and response. The dissemination of timely and accurate information is paramount to individuals, communities, and emergency management personnel making wise decisions and avoiding danger before, during, and after disasters (Chen, Chen, Vertinsky, Yumagulova, & Park, 2013; Kulig, Reimer, Townshend, Edge, & Lightfoot, 2011; Norris et al., 2008; Reininger et al., 2013; Young, 2014).

Community Competence and Community Resilience

Community competence is the collective capacity of individuals to learn about the social environment and use the information to take collective action and make informed decisions (Norris et al., 2008). Essentially, a competent community can effectively identify problems and establish consensus in working towards addressing those problems to meet the needs of the community. Community competence is highly reliant on social trust and communication as well as the existence of resources and networks. The lack of resources and networks during Hurricane Katrina demonstrated how the long-term establishment of resources and networks within communities are paramount to mitigating and responding to natural and man-made disasters. Communities tend to perform better before, during, and after disasters if they share a sense of empowerment, are socially

cohesive, and believe in the good of the community (FEMA, 2011; McCrea et al., 2014; Norris et al., 2008; Plodenic, Edwards, & White, 2014; U.S. DHS, 2010b, 2014a).

Human Mobility and Community Resilience

While the majority of studies on community resilience suggest the community is established (i.e., the residents have lived in the same neighborhood for a period of time), it is important to acknowledge the effects and vulnerability of human mobility (International Organization for Migration [IOM], 2014). Human mobility is an integral feature of past and current development of communities and societies because it contributes to their location, size, density, and composition (Martine, Schensul, & Guzman, 2013). Furthermore, human mobility and disaster management is linked because hazards or changes to the environment can generate (or reduce) risks such as the incapacity to move before, during, and after disasters as well as the potential of displacement following disasters (IOM, 2014). This concept is especially important in Yuma, Arizona because the population increases by 90,000 as visitors arrive to take advantage of the warm winters and migrant workers are a main part of the labor force between November and March (Yuma County, 2014). The inclusion of visitors and workers with disparate concepts of social capital and community resilience will inevitably create challenges during natural and man-made disasters.

Finding a Tangible Way to Measure Community Resilience

Although the model proposed by Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum (2008) improved the identification of the factors that contribute to community resilience, measuring it remained problematic. However, when Kulig, Edge,

Townshend, Lightfoot, and Reimer (2013) adapted elements of the Community

Resilience Scale (Kulig et al., 2008; Kulig et al., 2011) to create a revised scale called the

Index of Perceived Community Resilience (IPCR). The IPCR narrowed the scope of the

15-items on the Community Resilience Scale that were developed from the community

members' perceptions of resilience-related items. The IPCR is an 11-item index that

incorporated the Norris, Stevens, Pfefferbaum, Wyche, and Pfefferbaum's (2008) set of

networked adaptive capacities, the aforementioned community resilience models, as well

as Cutter et al.'s (2008a) Community and Regional Resilience Initiative model and Cutter

et al.'s (2008b) Disaster Resilience of Place model. In a mixed methods research study of

two resource-dependent rural communities that had experienced wildfires, Kulig et al.,

found that the IPCR provided a useful composite of perceived community resilience. This

is the basis for which I designed the interview questions in my study to answer my

research questions pertaining to community resilience (see Appendix A).

Whole Community Approach

The whole community approach is an important aspect of social capital,

community resilience, homeland security, and homeland defense. The concept originated

shortly after 9-11 with the establishment of the Citizen Corps, a grassroots movement,

intended to establish opportunities for citizens to take an active role in securing their

homeland and supporting emergency responders and local governments. The Citizen

Corps is administered by FEMA, but locally implemented by Citizen Corps Councils

(FEMA, 2014). While the Citizen Corps is an effective movement, it works best in

communities that already function as a cohesive community.

In 2011, FEMA developed the whole community approach to improve preparedness on a national level. During his March 2011 testimony to Congress, FEMA Administrator, Craig Fugate, acknowledged the inherent challenges in emergency management when the burden of protecting and educating communities fell primarily on state and local governments. He acknowledged that future disaster management would not succeed without the investment of the nation's citizens, their local neighborhoods, as well as academia, and the public and private sectors (FEMA, 2011). In December 2011, FEMA published *A Whole Community Approach to Emergency Management: Principles, Themes, and Pathways for Action* to provide more guidance regarding the implementation of whole community preparedness discussed in the *National Preparedness Goal.* Inherent in the whole community approach are the following concepts: shared understandings of the community's needs and capabilities; the application of town hall meetings and educational seminars for the public; the integration of resources throughout the community; individual and collective preparedness; and, greater community resilience (FEMA, 2011, p. 3).

Homeland Security and the Whole Community Approach

The whole community approach as described by FEMA and the DHS is one of the pillars of emergency management before, during, and after a disaster (FEMA, 2011; U.S. DHS, 2010a, 2014a). It is a means to enable residents, emergency management professionals, community leaders, stakeholders, and government officials to develop a greater understanding of the needs of the respective community (FEMA, 2011, p. 3). In addition to improving emergency management, application of whole community

approach can improve community resilience and social capital. The benefits of this approach include: shared understanding, greater empowerment and integration of resources, stronger social infrastructure, established relationships, increased preparedness, and greater resiliency (FEMA, 2011, p. 3; Plodenic et al., 2014).

Through the publication and implementation of policies, the U.S. government continues efforts to work to improve the public's attitude toward the federal government (e.g., the DHS and FEMA), their overall understanding of threats to homeland security, and their involvement in homeland security and homeland defense. As previously noted, securing the homeland requires the efforts of the national enterprise. One of the most critical elements is the collaborative effort of individuals and communities to build and maintain social networks and social infrastructure that enable high levels of social capital.

Agro-Terrorism

The 2014 QHSR suggested that a terrorist attack against critical infrastructure such as agriculture could significantly affect the homeland. This study focuses on the terrorist threat to agriculture in agriculturally significant Yuma, Arizona. As noted in the 2014 QHSR, a bioterrorist attack becomes more likely as the capability, knowledge, and resources required to conduct an attack becomes more accessible (Elbers & Knutsson, 2013; Gill, 2015; Keremidis et al., 2013; Moats, 2007; Monke, 2007; Olson, 2012; U.S. DHS, 2014a; Yeh, Park, Cho, & Cho, 2012). The United States has spent more than 15 years responding to an unprecedented terrorist attack, the growing complexity of emergency management, and the relentless challenges of homeland security. Nevertheless, while efforts to achieve national preparedness continue, the United States

has not applied enough effort in mitigating unprecedented attacks against critical infrastructure, especially agriculture and food (Appel, 2013; Hirsch, 2013; Moats, 2007; Olson, 2012; Rohn & Erez, 2013; U.S. GAO, 2011a, 2016b).

Agro-Terrorism a Black Swan Event

It is important to acknowledge that scholars and professionals may consider a large-scale agro-terrorist attack as an unlikely, low-probability event, largely due to the lack of precedent. The term for an event that would have a high impact, but largely considered unlikely has been coined a "black swan event" (Taleb, 2007). A black swan event (whether positive or negative) is considered outside the realm of expectations but it remains plausible and assessed to have an extreme impact (Taleb, 2007). It is largely human nature to discount events that have yet to occur in our lifetime (Holdeman, 2011). However, the lack of precedent should not discount the existence of vulnerability and the significant secondary and tertiary effects that an agro-terrorist attack could have on U.S. socio-economics (Appel, 2013; Chomel & Sun, 2010; Gill, 2015; Gyles, 2010; Olson, 2012; Rohn & Erez, 2013; U.S. GAO, 2011a, 2011b). Moreover, while the level of vulnerability does not automatically equate to a concomitant level of risk, the vulnerabilities inherent in the production of agriculture and food result in a semi permissive environment for domestic or international terrorists to attack livestock, vegetables, and food processing and packaging plants (Elbers & Knutsson, 2013; Monke, 2007; Olson, 2012; Yeh, Lee, Park, Cho, & Cho, 2013).

Agro-Terrorism: A Plausible Threat

The use of bioterrorism may be a more practical, cost effective, and less susceptible to gaining attention than the use of explosives due to the availability of biological agents (Appel, 2013; Elbers & Knutsson, 2013; Gill, 2015; Keremidis et al., 2013; Seebeck, 2007; Yeh, Park, Cho & Cho, 2012). Additionally, production and distribution of the food supply is a complex system, involving over 10 waypoints between the farm and the consumer (Appel, 2013; Chalk, 2004; Fischetti, 2007; Gill, 2015; Institute of Medicine and National Research Council, 2015; Monke, 2007; Olson, 2012; Yeh et al., 2012). Many of these waypoints (see Figure 1) are vulnerable to sabotage largely because of the side effects of the production continuum such as: farms are disbursed across the country with little to no security, some livestock are often confined and commingled with other herds, and constant demands for more efficient (economically beneficial) production practices (Bruzzone, Longo, Massei, Nicoletti, & Agresta, 2014; Elbers & Knutsson, 2013; Gill, 2015; Keremidis et al., 2013; Monke, 2007).
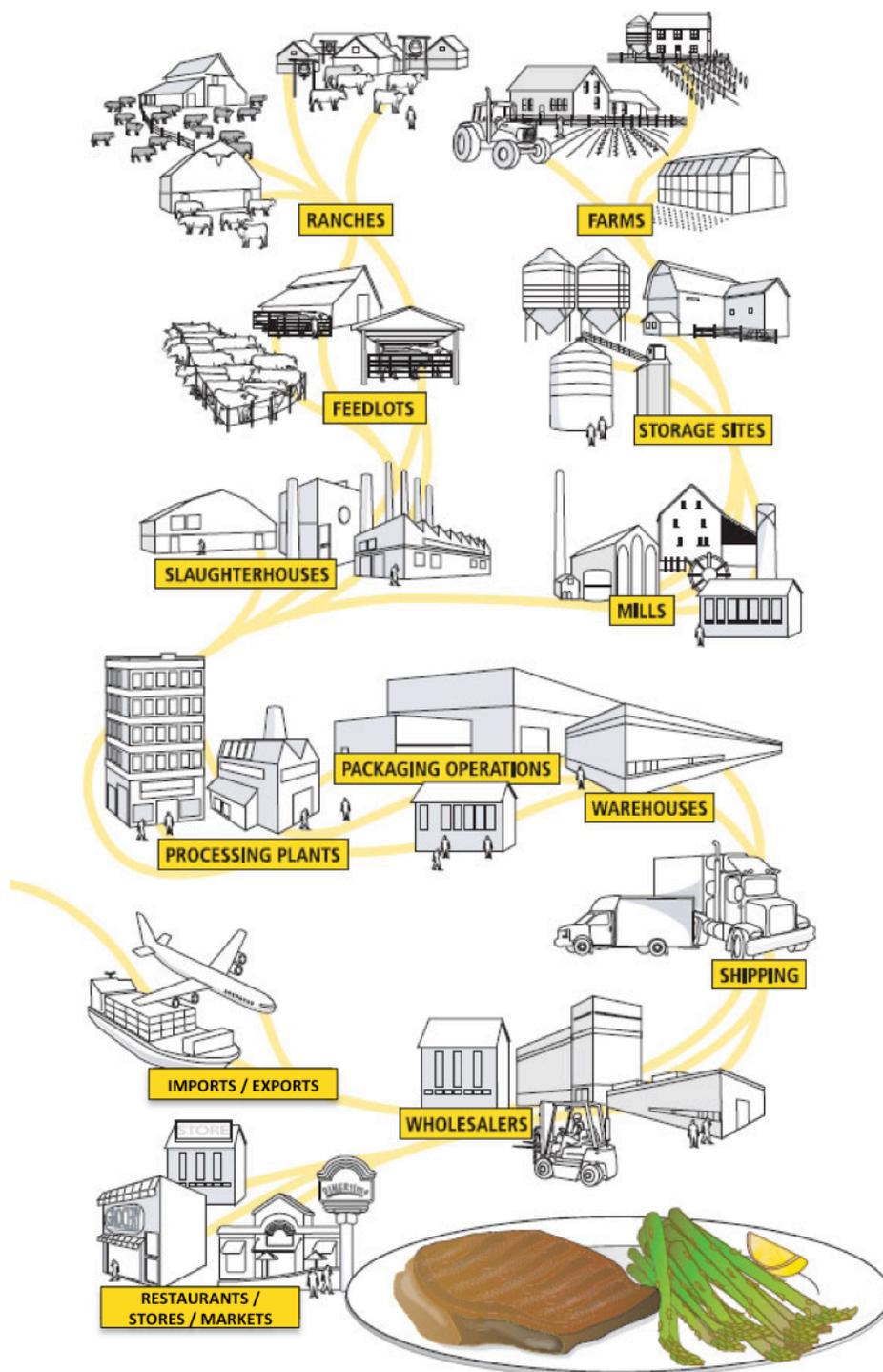
Figure 1. Food processing waypoints. From "Is your food contaminated?" by M. Fischten, 2007, *Scientific American, 297*, 112-117. Reprinted with permission.

Terrorists may consider an agro-terrorist attack as a secondary tactic because it would not garner as much immediate and constant media attention as a terrorist attack using explosives (Elbers & Knutsson, 2013; Gill, 2015; Gyles, 2010; Olson, 2012). However, the actual intended effect of terrorism goes beyond gaining media attention and discrediting government officials; it also includes the intentional detriment to the U.S. economy (Crenshaw, 2005; Hoffman, 2006; Jackson, Dixon, & Greenfield, 2007; Mahan & Griset, 2008). In that regard, an agro-terrorist attack is a viable and valuable terrorist target and has been recognized as a national security threat (Chomel & Sun, 2010; Olson, 2012; Rohn & Erez, 2013; Seebeck, 2007; U.S. DHS, 2004; Yeh et al., 2012; Gill, 2015). As noted by Chalk (2004), a large-scale agro-terrorist attack will affect the economy in three ways: first the destruction of livestock and/or containment measures; second, the indirect effects to businesses and industries involved in the complex food system; and lastly, the cost of protective trade embargoes will affect international business. For example, in 2001, the outbreak of foot-and-mouth disease cost the United Kingdom $21 billion and in 2006, the contamination of animal feed cost the Netherlands $1 billion (Gyles, 2010; Yeh et al., 2013). While those events were not examples of a bio- or agro-terrorist attack, outbreaks and contamination can significantly affect the economy.

A Historical Review of Bio-and Agro-Terrorism

History continues to serve as a noteworthy teacher; the use of biochemical warfare dates back to the mid-1300s (American College of Physicians, 2014; Chomel & Sun, 2010; Levy & Sidel, 2012; PBS, 2002; Yeh et al., 2012). For example, the Tartar armies that invaded modern day Ukraine, the Germans during World War I, and the

Russians and Americans during the Cold War have all employed the use of biochemical warfare weapons such as anthrax, botulinum toxins, and smallpox agents (American College of Physicians, 2014; PBS, 2002; Yeh et al., 2012). Furthermore, in 1952, a nationalist liberation movement in Kenya (the Mau Mau) targeted British cattle using a local plant toxin *(synadenium grantii;* Keremidis et al., 2013; Monke, 2007; Yeh, et al., 2012).

Individuals and organizations have also conducted attacks against humans and animals for personal gain and/or profit. In 1984, between September and October, a religious cult in Oregon contaminated 10 restaurants in The Dalles, Oregon with *(salmonella typhimurium)* to influence the outcome of an election. The attack sickened 751 people and is considered the largest biological terrorist attack in the US as of 2015 (Gill, 2015; Olson, 2012). In 1985, Mexican workers infected livestock in Mexico with screwworms (*cochliomyia hominivorax)* to secure their jobs. In 1996, disgruntled workers contaminated a cow carcass intended for animal feed with pesticide that consequently contaminated 80,000 pounds of feed and resulted in a large-scale recall that cost approximately $250 million (Pampel, 2006). In 1997, personnel employed at a feed company contaminated animal grease intended for chicken feed produced by a rival feed company. The investigation required the efforts of law enforcement officials in 17 states (Gill, 2015; Pampel, 2006). In 2003, a disgruntled employee contaminated nearly 200 pounds of ground beef that infected over 90 individuals (Center for Disease Control, 2003; Pampel, 2006). In 2011, a South African man was arrested for threatening to spread foot-and-mouth disease (FMD) in the United States and Great Britain (Keremidis

et al., 2013). Lastly, in 2014, a Japanese factory worker contaminated frozen food products, injuring nearly 900 people (Lui, 2014). The aforementioned examples of bio- and agro-terrorist attacks illustrate how the majority of biological agents used in attacks are environmentally resilient and easy to acquire and deploy by terrorists with a variety of political, religious and environmental motivations (Gill, 2015; Keremidis et al., 2013; Olson, 2012; Rohn & Erez, 2013; Yeh et al., 2013).

These examples also demonstrate a paradigm shift in the vulnerability of critical infrastructure to an attack. The concept of critical infrastructure was previously considered as physical and independent assets. However, the interdependence of industries and technologies has rapidly shifted the dynamics of how much access individuals and/or groups have to U.S. critical infrastructure such as agriculture and food (Gill, 2015; Keremidis et al., 2013; Monke, 2007; U.S. DHS, 2004, 2014a). In that respect, the feasibility of a modern day agro-terrorist attack targeting large populations will likely continue to increase. More importantly, the potential impacts of an agro- terrorist attack goes beyond the livestock, produce, and the corporations within that farm- to-consumer continuum. The damage could surpass the agricultural community; attacks have the potential to threaten food security, which could ultimately cause economic disruption and social disorganization (Chalk, 2004; Gill, 2015; Keremidis et al., 2013; Monke, 2007; Oladosu et al., 2013; Olson, 2012; Rohn & Erez, 2013; U.S. DHS, 2004, 2014a).

Food Security

When discussing the public's responses to a threat to food security and possible food shortages it is important to acknowledge the use of the terms *food security*, *food safety*, *food defense*, and *food shortage* as all of these terms will be points of discussion.

Food security exists when there are sufficient levels of safe and nutritious food to meet the daily needs of individuals and enable active and healthy lives (FAO, 2014; WHO, 2014). The concept of *food security* involves the availability, accessibility, and use of food. Food security is at risk from new threats and there is a growing awareness of previously unrecognized sources of instability. As the food system becomes increasingly globalized and interconnected, concerns of potential disruptions to food security remain a topic of discussion (Adams, 2013; Chalk, 2004; Chatham House, 2014; Gill, 2015; Green & Knechtges, 2015; Hinrichs, 2013; Leung, Epel, Willett, Rimm, & Laraia, 2015; Maroto, Snelling & Linck, 2015; Oladosu et al., 2013; Olson, 2012; Rohn & Erez, 2013). *Food safety* refers to taking appropriate measures to preserve the quality of food in an effort to prevent contamination and foodborne illnesses (U.S. DHS, 2014b; University of Maryland Medical Center, 2015). *Food defense* is the protection of the nation's food supply from intentional adulteration by biological, chemical, physical, or radiological agents. It addresses additional concerns including physical, personnel, and operational security (USDA, 2015, 2014b). Lastly, a *food shortage* occurs when individuals and families cannot grow or buy enough food to feed themselves, nor can they access other food sources (United Nations University, 2013).

Food Safety and Food Defense Efforts

Vulnerabilities to food security exist on various levels that continue to make the security of food a US and an international issue (Adams, 2013; Chatham House, 2015; Green & Knechtges, 2015; Leung, Epel, Willett, Rimm, & Laraia, 2015; Maroto, Snelling & Linck, 2015; Wang, Van Fleet, & Van Fleet, 2014). The infrastructure of the food and agriculture sector is a complex global enterprise whose connectivity serves as a benefit and a vulnerability to food security, food safety, and food defense (Chalk, 2004; Gill, 2015; Hinrichs, 2013; Olson, 2012). The food and agriculture industry is important to the social and economic stability of the US; in turn, its importance to stability is also its greatest vulnerability (Chalk, 2004; Gill, 2014; Oladosu et al., 2013; Olson, 2012; Rohn & Erez, 2013; U.S. DHS, 2014b; U.S. GAO, 2011a; Yeh, Park, Cho & Cho, 2012). The U.S. government has implemented several policies and procedures intended to preserve the quality of food (food safety) and protect the food supply (food defense).

Food safety. On December 21, 2010, Congress passed the Food Safety and Modernization Act (FSMA) marking a paradigm shift in how the US approached food safety; instead of focusing efforts on responding to contaminations, the new legislation focused on preventing them. The FSMA mandates the U.S. Food and Drug Administration (FDA) to enforce prevention-based policies and procedures (USFDA, 2011). Additionally, the FSMA holds food companies responsible for reducing risks of food contamination to domestic and imported food products (USFDA, 2011). The FSMA has made noteworthy progress in establishing procedures. However, the overall effectiveness of education and enforcement remains to be seen because the FDA has

spent four years (2011 to 2015) developing rules, guidance for the food industry, and reporting procedures to Congress to support the FSMA's goal of prevention rather than response (Taylor, 2015).

Food defense. Defending food and agriculture against an intentional attack requires the coordination and communication of many agencies. Three of the many pieces of legislation passed between 2001 and 2010 provide insight into the complexity of food defense and the importance of collaboration, coordination, and communication.

Food Emergency Response Network (FERN). The FERN originated from the 2004 HSPD-9 directive to protect the food supply against terrorist attacks, disasters, and emergencies. The U.S. Department of Health and Human Services and the Department of Agriculture were directed to improve the ability to detect, respond to, and recover from attacks targeting the food system. The FERN consists of local, state, and federal food testing laboratories to respond to the biological, chemical, or radiological contamination of food (USDA, 2011). Interagency coordination in the operation of the network is paramount to its overall success in responding to contamination incidents, testing the food source, and providing results once activated by the federal government (USDA, 2011).

Emergency Support Function (ESF) #11. As part of the government's overhaul of homeland security and homeland defense following the 9-11 terrorist attacks, the 2008 National Response Framework (NRF; first edition) developed standard operating procedures for responding to all types of disasters and emergencies (U.S. DHS, 2013). The framework includes 15 emergency support functions (ESFs) that establish the roles,

responsibilities, and procedures for coordinated federal responses during natural or manmade disasters and emergencies (FEMA, 2008). While all ESFs list the coordinating federal agencies, the NRF also emphasizes the roles that all citizens have in responding to natural and manmade disasters. ESF #11 – Agriculture and Natural Resources supports tribal, local, state, and federal efforts to protect agriculture and natural resources. Specifically, ESF #11 has five primary functions:

- Providing nutrition assistance through coordination with state agencies and the Food and Nutrition Service to provide food supplies when and where necessary.

- Respond to animal and plant diseases and pests by implementing a coordinated response to a highly contagious or economically detrimental animal, plant, or pest outbreak.

- Safeguard the commercial food supply through routine inspections and verifications of food safety and food inspection procedures in coordination with the Food Safety and Inspection Service.

- Protect natural and cultural resources and historic properties (NCH) by coordinating with the Department of Interior to establish the appropriate methods to preserve, rehabilitate, and restore NCH resources such as archeological sites, museums, and historic districts.

- Protect the safety and well being of household pets during emergencies and evacuations (U.S. DHS, 2013; U.S. DOI, 2014).

The successful activation of ESF-11 and the accomplishment of its five primary responsibilities rely heavily on the coordination efforts with the Food and Nutrition Service, the Animal and Plant Health Inspection Service, the Food Safety and Inspection Service, the Department of Interior, and FEMA (U.S. DHS, 2013).

National Outbreak Reporting System (NORS). In 2009, the Centers for Disease Control and Prevention (CDC) launched the NORS. The NORS enables U.S. health departments to enter information about outbreaks originating from waterborne, foodborne, person-to-person, and animal diseases as well environmental contamination into a database. Health departments, researchers, and public health officials use the data to understand the origins, impacts, and means of preventing future outbreaks (CDC, 2013).

The FERN, ESF #11, and the NORS have established coordinated efforts to protect the food supply, develop standard operating procedures to responding to disasters that threaten food security and respond to outbreaks while deterring future outbreaks. However, the research on food security, food safety, and food defense measures since 9-11 suggest that most efforts to improve processes to safeguard the agriculture and food industry remain focused on educating and training the respective businesses, government entities, and stakeholders of the agriculture and food industry rather than the average citizen (FEMA, 2008; USDA, 2011; U.S. DHS, 2013; USFDA, 2011). The lack of training at the individual and community level could exacerbate conditions of fear and uncertainty when there is a perceived threat to food security.

Conclusion

My review of the literature provided the foundation for this study. Through reviewing the literature I discovered the challenges in choosing a research topic that has not been heavily researched. Nevertheless, I did learn that social capital is a complex theory that has a well-respected influence in modern day social science. There is a connection between social capital and community resilience during natural and man-made disasters that could have a significant impact on society's ability to respond to and recover from crises. Moreover, the efforts by the U.S. government to improve food safety and food defense procedures were primarily focused on government entities and stakeholders within the agriculture and food industry rather than the average citizen.

The current research is deficient in understanding how a lack of social capital and community resilience could be the catalyst for social disorganization and possibly anomie during an attack that threatens a basic need such as food security. I conducted this study to fill this gap in research by examining and analyzing the perceived threats to food security and possible food shortages following an agro-terrorist attack. In this research I identified potential catalysts to social disorganization sparked by said perceived threats and subsequently could assist federal, state, and local governments in establishing the means to build/improve social capital and mitigate social disorganization following a disaster that threatens basic needs such as food.

Chapter 3: Research Method

Introduction

The purpose of this ethnographic case study was to examine the perceived threats

to food security and the possible responses to food shortages in an agriculturally

significant community. Literature has indicated the lack of federal, state, or local

government plans to mitigate possible responses to a perceived threat to food security and

possible food shortages. In this study, I described and analyzed the perceived threats to

food security and the possible responses to food shortages in Yuma, Arizona based on a

hypothetical agro-terrorist attack on the U.S. food supply. Yuma, Arizona is

agriculturally significant because Yuma produces 90% of all leafy vegetables grown in

the United States during the winter months. Furthermore, the City of Yuma shares over

120 miles of the U.S.-Mexico border (U.S. Customs and Border Protection, 2014),

creating a unique aspect of homeland security and homeland defense not experienced in

other agriculturally significant areas.

In this chapter, I examine the research design and rationale for the study, the role

of the researcher, methodology of the research, demographics and participant selection of

the study, the subsequent instrumentation, data collection and analysis techniques, issues

of trustworthiness, as well as inherent ethical considerations throughout the research

study.

Research Design and Rationale

The research questions were derived from the need to determine the perceived

threats to food security in Yuma, how citizens in that community may react to food

shortages, their expectations from their local government in such a crisis, and whether community resilience is present and may affect said reactions.

Central Research Question

What are the perceived threats to food security in an agricultural community in Arizona and the possible responses to food shortages to a hypothetical agro-terrorist attack on the U.S. food supply?

Sub questions

1. To what extent do the citizens of Yuma, Arizona believe their local government can provide assistance when a threat to food security exists?

2. To what extent does community resilience in a community within Yuma, Arizona affect possible responses to food shortages?

Exploring the Research Tradition

The nature of this study where I examined and analyzed individual perceptions and fears as well as relationships within communities dictated the use of the qualitative research design. Qualitative research enabled me to identify, describe, measure, and analyze the insights and perceptions of the select citizens of Yuma, Arizona through interviews and observations (Creswell, 2009; Frankfort-Nachmias & Nachmias, 2008; Patton, 2002). The qualitative approach also allowed me to conduct expert interviews of emergency management and law enforcement personnel using open-ended questions. Lastly, this method allowed me to describe my observations and interpretations of my data. When determining the best qualitative research approach for this study, I explored the benefits of an ethnographic approach and a case study approach.

Ethnographic study. The ethnographic approach to qualitative research has its origins in anthropology, where the researcher studies a cultural group in its natural setting, over a period of time through interviews and observations (Creswell, 2009). Originally, the concept of culture was closely affiliated with ethnicity and geographic location. However, ethnography has evolved to include any group or organization with the understanding that groups/organizations develop through relationships and a shared culture (Trochim & Donnelley, 2006). Moreover, in ethnography, the researcher is responsible for describing and interpreting the shared patterns of values, behaviors, and beliefs of a culture-sharing group (Creswell, 2013).

Applying the concepts of ethnography to my study improved my ability to evaluate the expressed ideas and beliefs of the citizens of Yuma. Moreover, I evaluated if there was a shared culture in a respective community. Through semi structured interviews using open-ended questions, I relied on the participants' *emic* perspective, reported them verbatim (using interview notes and journaling), and then synthesized the data using an *etic* perspective to interpret the culture (Creswell, 2013). While the ethnographic approach allowed me to assess the intimate emotions and beliefs of the participants, using this approach could have had unintended (positive or negative) consequences because my interaction with the participants could have led to their increased self-awareness and self-knowledge (Murphy & Dingwall, 2001). Methods to minimize this potential impact will be further discussed in the ethical procedures section of this chapter.

Case study. The case study approach to qualitative research has its origins in social science through anthropology and sociology. Antecedents of the qualitative case study research include the study of families by French sociologist Leplay, and the study of the Trobriand Islands by anthropologist Malinowski from the 1920s and 1930s (as cited in Creswell, 2013). Modern day disciplines within social science, namely psychology, medicine, law, and political science, use case studies frequently (Creswell, 2013). In a case study, the researcher seeks to develop an understanding of a single contemporary bounded system (a case) within a real-life context (Creswell, 2013, p. 97). Furthermore, the researcher has the opportunity to experience and analyze real-life circumstances by various means of attaining data such as observations, interviews, and the use of archival and government documents (Creswell, 2013; Miles, Huberman, & Saldana, 2014; Patton, 2002).

Like the ethnographic study, there are several noteworthy characteristics of a case study. The researcher must have a case to study, which could be an individual, a small group, a community, or a specific project (Creswell, 2013). In my study, the case is a community within Yuma, Arizona. In good qualitative case studies, the researcher strives to develop an in-depth understanding of the case by methodically determining the best means of collecting and analyzing the data to capture the inherent themes and issues of the case (Creswell, 2013; Maxwell, 2013). Capturing the descriptions, themes, and issues while conducting my field study of the citizens of Yuma was critical to drawing a conclusion and determining the perceived threats to food security and possible responses to a food shortage.

Justification for an Ethnographic Case Study

Combining research methods to develop an ethnographic case study was used to explore the possible responses to a perceived threat to food security and possible food shortages following an agro-terrorist attack. This was an ethnographic study because I examined and described the beliefs, values, and attitudes of a community in Yuma, Arizona that theoretically structures the behavior of the community from a sociocultural perspective. It was a case study because it provided a holistic investigation of a unit of analysis (nine individuals that represent the community). Due to the complexity of the topic and the inherent challenge of using a hypothetical event as a means of exploration, the ability to observe people in their natural settings (ethnographic research design) improved the breadth and depth of data collection (Creswell, 2013; Hammersley & Atkinson, 1995; Maxwell, 2013). Additionally, the detailed investigation of the case and its context through triangulating data from interviews, observations, and various documents to establish a holistic and unbiased interpretation of the data (case study research design) provided sufficient basal facts and increased the objectivity of the data (Creswell, 2009; Patton, 2002; Stake, 2005). Ultimately, the ethnographic case study design allowed me to gain knowledge of the participants' experience with community resilience, their possible reactions to a food shortage after an agro-terrorist attack, and the potential effects their reactions could have on the community in Yuma, Arizona.

<div align="center">

Role of the Researcher

</div>

In a qualitative study, the researcher must remain neutral and unbiased as he or she learns from the participants and analyzes how each participant interprets his or her

life (Creswell, 2009, 2013; Marshall & Rossman, 2011; Patton, 2002; Stake, 2005). As the interviewer, I had the challenge of establishing rapport with the citizens of Yuma, Arizona, adequately expressing the intent of the study and how it may affect the community, and always being self-aware of how my verbal and nonverbal communication was interpreted by the target audience (Creswell, 2009, 2013; Marshall & Rossman, 2011; Maxwell, 2013). I assumed the role of the interviewer and was fully engaged with the participants to develop rapport. I also fully disclosed the goals of my research (Creswell, 2009, 2013; Frankfort-Nachmias & Nachmias, 2008).

Establishing Trust and Rapport

I did not have any relationships with the citizens of Yuma, Arizona and had never visited the city prior to my field study. Therefore, my efforts to initiate and negotiate relationships with community leaders, members of the agricultural community, and citizens in Yuma were paramount to gathering data that are valid and valuable (Frankfort-Nachmias & Nachmias, 2008; Maxwell, 2013). However, I was a military resident of Sierra Vista, Arizona and developed friendships with members of the police force, fire department, and sheriff's office. I leveraged my experience with those personnel when establishing rapport and trust with government officials in Yuma, Arizona. Establishing trust and rapport with the citizens of Yuma required extensive studying of the community through publically accessible government data and electronic media, such as the Yuma daily newspaper. Prior to my field study, I gained insight into the interests of the stakeholders in Yuma's agricultural community as well as the goals and objectives of Yuma's government officials. Additionally, following approval from Walden

University's Institutional Review Board (IRB), I contacted stakeholders within the agricultural community, emergency management and law enforcement personnel, and government officials, and explained the importance and relevance of this study.

I managed personal bias by researching government data and academic articles on agriculture in Arizona prior to conducting research to improve my situational knowledge of the area. I consider the lack of personal and professional relationships with the citizens of Yuma a positive factor to managing my bias. On the other hand, my lack of familiarity with the area could have created unintended consequences (ethical issues) such as developing an affinity or contempt towards the city and its citizens during my field study. However, the daily journaling of my thoughts and emotions after my interactions with the participants and the community assisted in managing the inevitable stress of fieldwork, enabled me to capture my emotions, and provided a state of openness where I evaluated my assumptions and beliefs about the study and its participants (Darra, 2008; Dowling, 2006; Hubbard, Backett-Milburn, & Kemmer, 2001). Journaling also enhanced the credibility of my research because I routinely audited the research process (Glaze, 2002).

Methodology

The methodology in qualitative research involves a combination of theory and perspective. By nature, qualitative research is inductive, emerging, and shaped by the researcher's research of the topic, selection of participant criteria, experience in the field and collection, and analysis of the data (Creswell, 2013; Miles et al., 2014). To address the aforementioned research questions within this ethnographic case study, I obtained the data through semi structured interviews, observations, and official documents that focus

on Yuma's agricultural practices, any local and state government plans to deter threats to agriculture, the presence of community programs, and the relative atmospherics between the citizens and government officials. I obtained contextual material from multiple sources to improve validity and help deter bias. In the following sections, I describe the participant selection logic and provide discussion on the population, the sampling strategy, the criteria for participant selection, the procedures for recruiting participants, data sources and data collection procedures, and the data analysis plan.

The Population

The year-round population in the City of Yuma is 200,000 due to the increase of over 90,000 residents during the winter months. However, in this study, I focused on the estimated 93,400 regular residents of Yuma City, Arizona (U.S. Census Bureau, 2015; Yuma Visitors Bureau, 2014). At least 66% of the population is between 21 and 60 years old; the median age is 31.3 years old. Males make up 50.8 % of the population. The population is 68.8% White (with 54.8 % identifying themselves as Hispanic or Latino), 3.2% Black, and less than 2% American Indian, Alaska native, or of Asian decent (U.S. Census Bureau, 2015). An estimated 34,300 (over one-third) of the population work in the agriculture industry (not including mining, quarrying, and oil/gas extraction (U.S. Census Bureau, 2015). Of the 53,770 of the population over the age of 25 years old, 26.3% finished high school (or the equivalent), 28.3% have some college (no degree), 7.4% have an Associate's degree, 11.0% have a Bachelor's degree, and 5.4% have a Graduate or professional degree (U.S. Census Bureau, 2015). The median household income is $44, 220 a year.

Understanding the demographics of the population enabled me to obtain an accurate representation of the City of Yuma in my study. Given the demographics, I wanted to ensure the participants of my study reflected the average age and racial diversity of the population. For example, the community is mostly comprised of middle-class working families. Some households are comprised of migrant, African-American, or Native American families and others consist of farming and ranching families. Therefore, when I conducted field research on nine residents, I attempted to interview representatives from the racially diverse community. In addition to race, I wanted to ensure the participants represent the nearly equal number of men and women. Lastly, historically, the City of Yuma's unemployment rates nearly double from mid-April through early-October due to the seasonal agricultural-based economy (Bureau of Labor Statistics, 2015; Taracena, 2014).

Sampling Strategy

I used the purposeful sampling strategy to identify and select interview participants. In purposeful sampling, researchers use their judgment and knowledge to choose participants based on their determination of which participants will represent the population and be most useful in the research (Frankfort-Nachmias & Nachmias, 2008). Purposeful sampling enabled me to select participants and sites in this study (Creswell, 2013) that led to an in-depth understanding of the participants and their natural environment (Patton, 2002).

I interviewed nine individuals within Yuma City, Arizona. I also conducted expert interviews of law enforcement and emergency management personnel. I used two sets of

interview questions, one for the citizens (see Appendix A) of Yuma and another for the respective experts (see Appendix B). When interviewing residents of the community, I used the same interview questions in the same sequence to ensure validity and credibility (Creswell, 2013; Miles et al., 2014; Patton, 2002). When interviewing respective experts, it varied between professions; however, all interview questions were open-ended questions, followed a predetermined protocol, but included enough flexibility to explore, probe, and respond to individual differences (Frankfort-Nachmias & Nachmias, 2008; Miles et al., 2014; Patton, 2002).

Criteria for Participant Selection

The major objective of sampling the population in a research study is to select participants based on criteria that are conducive to the purpose of the study; carefully selecting the appropriate participants, settings, and processes are crucial to data analysis (Frankfort-Nachmias & Nachmias, 2008; Miles et al., 2014). It is not uncommon for the initial sampling plan to transform in qualitative research once the fieldwork begins. Nevertheless, establishing a sampling frame is useful tool for establishing preliminary criteria for participants. A sampling frame is an objective list of the population of interest (Frankfort-Nachmias & Nachmias, 2008).

My initial sampling frame consisted of a list of working communities with an estimated annual income of $34,000 to $44,000 within Yuma, Arizona that have a diverse population comparable to the overall demographics of Yuma city and have residents who are involved (economically, personally, or professionally) in the agricultural industry. The criteria for selecting interview participants were based on the

following factors: his or her location of residence in a selective community, his or her involvement or familiarity in Yuma's agriculture community and/or industry, and his or her willingness to participate in the study. The total population of potential participants was 10 to 15 individuals in one residential community. The rationale was 10 to 15 individuals in one community should represent the population in a community of approximately 40 households. If saturation had not been reached after interviewing 10 to 15 individuals, I planned to interview an additional two to four individuals in the same residential community.

Procedures for Identifying, Contacting, and Recruiting Participants

I used the process of purposeful sampling to find communities that met the aforementioned criteria. Specifically, I contacted the Yuma Chamber of Commerce, the Community Development Director, the point of contact for Yuma's Farmer's Market, and the Fire Department's Public Information Officer to find potential participants. I also used statistics from the city-data.com website to locate communities that met the research criteria. Once I identified potential participants I initiated communication through the mail. Specifically, I sent a letter of introduction explaining the purpose of the research study and a consent form that formally requested their participation in the study. It also included a request for the participants to answer questions about their ethnicity, economic status, and occupation to ensure potential participants met the aforementioned criteria. I used a similar approach for recruiting experts. I contacted the offices of the Yuma Police Department's Chief of Police, the Yuma Emergency Management Department's Director, the Yuma Fire Department's Fire Chief and the Yuma U.S. Agricultural Department's

Director via a letter of introduction and consent sent by mail. I offered to conduct interviews over the phone or via email, if face-to-face interviews conflicted with the expert's schedule. All willing participants (residents and experts) were required to sign the statement of consent at the end of the letter of introduction indicating they would participate voluntarily and understood the purpose of the study. I offered each individual (not including the expert participants) a compensation of $15 for his or her participation in the study.

Data Collection Procedures

The various data collection methods I used in this study include field notes, journals, participant observations, and discussions with stakeholders, experts, and residents, as well as face-to-face interviews and interviews by electronic mail. I also accounted for the data derived from the research of local entities such the Yuma Main Library, the Chamber of Commerce, the Farmer's Market and the Community Development Division. I used an interview protocol that enabled me to account for verbal and nonverbal communication from the participants. The interview questions for the residents (see Appendix A) explored three concepts: trust in government assistance during a disaster, the presence of social capital, and the existence and/or likelihood of community resilience for the residents following an agro-terrorist attack that threatens food security. I developed the interview questions from concepts discussed in various qualitative and quantitative literature on the public's trust in their local and state governments' ability to provide assistance during disasters (Aldrich, 2010; Farazmand, 2007; Kemmelmeier et al., 2008; Nicholls & Picou, 2013; Teasdale et al., 2013;

Zembroski, 2011); literature on the levels of social capital in communities (Hausman et al., 2007; Hawkins & Maurer, 2010; Laycock, Mahone, & Filson, 2014; Reininger et al., 2013; Sampson, Raudenbush, & Earls, 1997); and, literature on community resilience and its relationship to disaster preparedness and response (Aldrich & Meyer, 2015; Brose, 2015; Kulig et al., 2013; Linnell, 2014; Norris et al., 2008).

I used the interview questions for the experts (see Appendix B) to explore their respective organization's involvement in food security and their inherent responsibilities when a threat to food security exists. I also examined the perceived responsibility of said organizations to the citizens of Yuma, Arizona following an agro-terrorist attack and a threat to food security. Furthermore, during the interviews I learned about the interaction between the citizens of Yuma and the respective organizations, to include the existence of educational classes on emergency preparedness and/or food security. Lastly, through the interview questions I examined the experts' perspective of the existence and availability of social networks, the existence of social cohesion, and the overall functionality of the community and its ability to respond to and recover from an agro-terrorist attack that threatens food security.

I interviewed residents in public locations such as restaurants and hotels as well as on a small seed farm. I interviewed the experts in their office or in a meeting room at their organization. I recorded the data from residents and experts using interview notes. I conducted the majority of the interviews over the span of six days with the exception of two electronic emails I received two days after my field study concluded. I interviewed the residents between 10 a.m. and 7 p.m. during the weekday and the weekends to

accommodate their schedules. I interviewed the experts during the weekday and during their respective work hours. I anticipated that all interviews would take between 30 minutes to an hour. However, when interviewing each participant I reiterated his or her ability to exit the interview at any time prior to the start of the interview. I concluded each interview by thanking the participant for answering the questions, reminding them of the purpose of the study, and providing them with a $15 gift card.

Data Analysis Plan

My primary means of analyzing the data came from the interviews of the residents and experts of Yuma, Arizona. During the interviews, I asked the residents 18 open-ended questions to determine their possible responses to a perceived threat to food security and possible food shortages after an agro-terrorist attack. The interview questions for the residents were focused on four themes: (a) the perceptions of fear following a threat to food security, (b) how the participants feel about their local government's ability to provide assistance when threats to food security exist, (c) the levels of social capital in the community, and (d) the existence of community resilience. In turn, I asked the experts 10 open-ended questions focused on the following themes: (a) their organization's involvement in preparations against threats to food security, (b) their responsibility to the citizens of Yuma, Arizona following a disaster that threatens food security, (c) their perceptions of social networks and social cohesion among citizens in the respective community, and (d) the perceived overall functionality of community resilience.

In an ethnographic case study it is paramount that the researcher analyzes the data using techniques that highlight the perspectives and interpretations of the participants of the study (Creswell, 2013; Maxwell, 2013; Miles et al., 2014). Using inductive coding, I developed the coding scheme based on the participants' response to the open-ended questions, the data derived from government documents, and my observations of the participants (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008). I also used the content analysis technique to analyze the participants' response for the presence of words and concepts that can be examined for meaning and relationships to the central and sub-research questions (Frankfort-Nachmias & Nachmias, 2008; Maxwell, 2013). I used the ATLAS.ti software to help organize, store, code, and analyze the data that I collected in the field.

Issues of Trustworthiness

Researchers bear the burden of ensuring the findings of his or her study are representative of the data that have been collected and analyzed, and are based on critical investigation. In other words, researchers must rigorously demonstrate the trustworthiness of the research by demonstrating the study is credible, transferable, dependable, confirmable, and ethical (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008; Rudestam & Newton, 2007). In order to establish trustworthiness in this study, I applied a combination of strategies to demonstrate validity.

Credibility (Internal Validity)

To establish credibility I used the triangulation strategy. Specifically, I leveraged different sources (e.g., residents, experts, government documentation, and peer-reviewed

research) to provide corroborating evidence (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008; Maxwell, 2013; Miles et al., 2014; Rudestam & Newton, 2007). While long-term participant observation would be an optimal strategy to determine internal validity (Maxwell, 2013), due to the budget constraints of my ethnographic case study, I could not conduct interviews over a period of more than a week. However, I applied the member check strategy by systematically soliciting feedback from the participants about the data and my conclusions (Miles et al., 2014). During the interviews I recorded participant answers verbatim and asked for clarity if their initial answers were vague or they used an acronym that I did not understand. This method ensured immediate validation and accurate interpretation of their verbal and nonverbal communication with me. I also used follow-up questions to verify that I accurately interpreted the participants' thoughts and perceptions (Maxwell, 2013; Miles et al., 2014).

Transferability (External Validity)

Applying the appropriate sampling strategy is paramount to establishing external validity (Creswell, 2009; Creswell, 2013; Miles et al., 2014). For this study, I used purposeful sampling to elicit participants that represented the population of the agriculturally significant community of Yuma, Arizona. Through the interviewing of nine residents and six experts, the level of transferability became evident as I analyzed the data and it also became apparent that participants of the study demonstrated similar perceptions, emotions, and feelings (Denzin & Lincoln, 2005). This ultimately demonstrated that the amount of information I attained in the study was adequate, that I sampled the information appropriately to meet the theoretical needs of the study, and that

I collected data that were rich and provided a complete picture of the environment (Maxwell, 2013; Rudestam & Newton, 2007).

Dependability (Reliability)

Determining reliability of one's research study demonstrates whether a researcher conducting the study multiple times would produce consistent results (Creswell, 2013; Miles et al., 2014; Rudestam & Newton, 2007). I included a thorough explanation of the research questions and research design, descriptions of the demographics of the participants of the study, in-depth discussion on the data collection methods and processes, and copies of the interview questions presented to the residents and experts of Yuma, Arizona. Additionally, to ensure a researcher can repeat this study, I have included an explanation of the coding themes and methodology, as well as a discussion of any modifications to the coding process during data analysis (Creswell, 2009, 2013; Patton, 2002). A thorough description of the coding process and how I interpret the data improves the overall credibility and legitimacy of the study.

Confirmability (Objectivity)

I avoided using terms such as "all" or "never," and phrases that do not promote parallel sexual, racial, and ethnic identity terms eliminated bias in my writing (Rudestam & Newton, 2007). Lastly, my use of self-reflection limited the amount of influence that I (as the interviewer) had on the participants. For example, as the interviewer I minimized my influence by avoiding leading questions and limiting my facial expressions and nonverbal communication, such as shaking my head in agreement during interviews (Maxwell, 2013).

Ethical Procedures

The use of self-reflection is equally important when identifying potential ethical challenges with the research study. The treatment of human participants during the recruitment process, fieldwork, and data analysis is a key component to the overall credibility of the research (Miles et al., 2014; Rudestam & Newton, 2007). Through research on the City of Yuma's culture my behavior and interaction with the population was conducive to mutual respect. For example, I remained cognizant that the participants could be sensitive to the topics of agro-terrorism, food insecurity, and food shortages because a robust agriculture industry in Yuma correlates to their emotional and physical stability. Therefore, when conducting interviews I upheld the highest level of integrity and confidentiality by constantly assessing the potential benefits or contributions of the research study against the costs to the participants (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008; Miles et al., 2014).

In keeping with the requirements of Walden University's IRB, IRB approval number 05-06-16-0409496 demonstrates that I understand the ethical considerations inherent in protecting human participants. Furthermore, this research study did not include the participation of pregnant women, prisoners, children, or individuals with mental illnesses or diminished capacity. Ethical concerns related to recruitment materials and processes, data collection and intervention activities, the treatment of data, and protections of confidential data will be addressed through discussions of confidentiality, coercion, consent, care, and communication (Rudestam & Newton, 2007).

Confidentiality

Safeguarding the identities of the participants is crucial to establishing and maintaining rapport with the participants as well as completing a research study that upholds the highest standard of ethics. I used pseudonyms for all participants, coded the personal data retrieved from the interview participants, and kept the key code separate from the interview data (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008; Maxwell, 2013; Patton, 2002). I refrained from using names when addressing participant reactions and comments in the study to prevent unintentional identification of participants.

Coercion

I contacted potential participants via mail and electronic mail with a letter of introduction that included a statement of consent. My lack of connections with residents or experts of Yuma, Arizona limited the chance of coercing them to participate in the research study. The letter of introduction included a statement that participants can withdraw from the study at any time.

Consent, Care, and Communication

The letter of introduction also included a personal introduction, a short background on the study, and provided full disclosure about the study to include the possible risks and benefits to the participants, their community, as well as the academic community. Prior to conducting each interview I reviewed the consent form of the participant and remind them that they retained the right to end the interview when they

wanted (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008; Maxwell, 2013; Rudestam & Newton, 2007).

Summary

In this chapter, I outlined the research design and rationale, the role of the researcher, the methodology of the research study, and justified the selection of the qualitative ethnographic case study. Furthermore, I provided an overview of the demographics and rationale for participant selection while discussing the proposed data collection and analysis techniques. My use of the data collection and analysis methods facilitated the requirement to address the research problem and answer the research questions. I identified issues of trustworthiness and ethical considerations to demonstrate the application of the highest degree of ethical practices to safeguard the participants of this study. In Chapter 4 I will discuss the results of the study.

Chapter 4: Results

Introduction

In this chapter, I provide a description of the setting and demographics of the field

of study, explain the method of data collection and analysis, and provide detailed results

of this ethnographic case study. The purpose was to examine, describe, and analyze the

perceived threats to food security and the possible responses to food shortages in an

agricultural community in Arizona (specifically Yuma, Arizona), based on a hypothetical

agro-terrorist attack on the U.S. food supply. Face-to-face and electronic interviews with

citizens and experts of Yuma, Arizona enabled me to obtain and analyze data as well as

discover themes associated with the participant's knowledge, experiences, and perception

regarding the following research questions:

Central Research Question

What are the perceived threats to food security in an agricultural community in

Arizona and the possible responses to food shortages to a hypothetical agro-terrorist

attack on the U.S. food supply?

Sub questions

1. To what extent do the citizens of Yuma, Arizona believe their local

   government can provide assistance when a threat to food security exists?

2. To what extent does community resilience in a community within Yuma,

   Arizona affect possible responses to food shortages?

Setting

The participants were nine citizens of Yuma and six experts from the Fire Department, the Sheriff's Office, the County Emergency Management Office, Yuma County Public Health Services, and the Yuma Police Department. Residents of Yuma were approached in various locations throughout the City of Yuma within a 6-mile radius of my hotel, which was near a popular shopping center, several agricultural plants and corporate offices, and housing developments. I introduced myself, informed them about the purpose and premise of the study, and asked if they would like to participate. Experts were initially contacted via mail (that included the letter of introduction and consent), phone, and email that included the letter of introduction and consent.

The volunteering residents were primarily interviewed in public locations, with the exception of one seed farmer whom I interviewed at his farm and an individual whom I interviewed at his office to accommodate their schedules. The experts were interviewed at their respective organizations in their office or in a conference room. My field study occurred in the middle of June 2016. Therefore, the large population of migrant agricultural workers and corporate representation from regional agricultural companies who were present in Yuma during the November-March harvest season had left Yuma, Arizona to harvest crops in California. Nevertheless, the participants of this study represented the yearlong citizens of Yuma, Arizona. During the week of my field study, temperatures in Yuma ranged from 101 to 119 degrees Fahrenheit, which sparked a discussion about the weather, the importance of water, and/or the relationship between

high temperatures and potential power outages during the interviews of nearly all 15 participants.

Demographics

There were four female and five male resident participants. I attempted to get an even number of female and male participants to represent the nearly even female to male ratio in Yuma City. However, the fifth female participant cancelled her interview and did not wish to reschedule. Five (56%) of the residents identified their race as Hispanic or Latino, while four (44%) of the residents identified their race as Caucasian (see Figure 2). All the participants were involved (economically, personally, or professionally) in the agricultural industry.
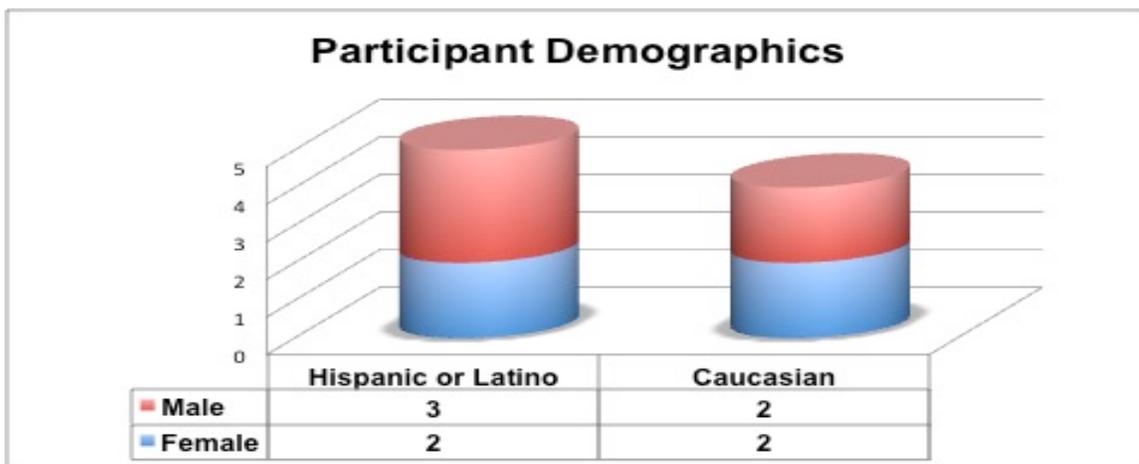
Figure 2. Participant demographics.

Regarding the expert participants, in addition to the Fire Department, the Sheriff's Office, the County Emergency Management Office, the Yuma County Public Health Services, and the Yuma Police Department, I attempted to include an expert from the Yuma Department of Agriculture, the Yuma County Water Users Association, and the Yuma Branch of the American Red Cross. However, I did not receive a response from

representatives of those organizations despite my correspondence via mail, email, and/or phone calls. Nevertheless, some of the experts of this study referenced the Department of Agriculture and/or the Red Cross as organizations they coordinate with to conduct emergency management, to provide community services, and/or to support the community and citizens of Yuma.

Data Collection

I conducted 15 interviews (nine residents and six experts) over a 1-week time span. All of the interviews, except two expert interviews, occurred in Yuma, Arizona. The last two expert interviews were received via electronic email after I returned from Yuma. At the beginning of the interview, I gave each participant the letter of introduction and consent. I asked them to read the document, and if they consented, to the interview to fill out the last page. I remained silent while they read the document but monitored their body language and waited for them to make eye contact if they had questions, comments, or concerns. Following the reading and signing of the consent form, I gave the nine residents their $15 gift card and reminded them of the anticipated timespan of the interview and their right to end the interview at any time. For the six experts, after they read and signed the consent form, I simply asked if they were ready to begin the interview.

All 15 participants answered all of the open-ended, semi structured interview questions. The residents answered 18 interview questions, while the experts answered 10 interview questions (see Appendix A and Appendix B). Despite the mentioning of an audio recorder in the letter of introduction and consent, I informed the participants that I

would not use an audio recorder. I made the decision not to use an audio recorder based on the nature of the topic and the one-on-one interaction with the participant. I manually recorded the participants' answers verbatim on the respective interview form. The interview protocol did not include any personally identifiable information. At the top of the interview protocol, I included their respective participant code, which was developed based on two letters in the alphabet, the date of the interview (YYMMDD), the letter "R" or "E" to identify them as resident or expert, and then their respective chronological number (i.e., AX160701R01).

After the participants answered the last question, I informed them that the interview concluded, thanked them for their time, and asked them if they had any closing remarks or thoughts. Only four residents provided a closing remark, none of which were directly related to the interview questions, but a point of personal reflection regarding the topic of this study. Additionally, one resident and four expert participants requested a summary of my research findings.

Data Analysis

Before I traveled to Yuma, Arizona, I reviewed the first three chapters of this study, paying special attention to the literature review. Then I conducted more research using the aforementioned key words, which resulted in finding 10 peer-reviewed journals from Thoreau Multi-Database and Google Scholar regarding agro-terrorism, community resilience, social capital theory, and emergency management. I also researched Yuma, Arizona via the Yuma Sun Newspaper, the Community Emergency Response Teams (CERT) Facebook page, and Yuma's local government page. Lastly, I conducted an

initial virtual reconnaissance of the surrounding area of my hotel to determine locations of housing developments, local government offices, and public libraries. This research before the field study helped inform my understanding of the physical environment as well as manage my time in Yuma, Arizona.

Explaining the Steps of Qualitative Analysis

Qualitative data analysis allows the researcher to holistically analyze and evaluate the data collected during interviews. The process involves the transformation of data into findings through the application of coding and subsequently arranging those codes into categories (Miles et al., 2014; Patton, 2002). My coding and categorizing process included several steps, and it is important to note that I used a combination of manual coding and the ATLAS.ti software (version 1.0.49). Manual coding served as my primary means of coding, while ATLAS.ti was my secondary tool. This dual approach, while time consuming, allowed for constant comparison of the analysis process.

Steps of analysis. First, the participant interviews were transcribed verbatim onto digital Word documents. In addition to the interview questions, I included any observation notes related to the respective interview. For example, when answering particular questions, the residents often included nonverbal communication before and during verbal communication. After transcribing the interviews into a word document, I changed the color of the participants' answers to blue font to differentiate between the question and the answers. Then I imported all electronic interview protocols into the ATLAS.ti software as separate documents for each resident and expert interview. I also recorded my journal notes for each interview into the *comments* section of the ATLAS.ti

software. My journal notes were also color coded into four categories: personal emotion, field study concern, field study events/reflection, and follow-up requirements.

Data analysis process for resident interviews. Next, I applied the following technique to each resident interview separately, starting in chronological order of the interviews:

1. I read each interview in its entirety.

2. I returned to the first interview question and read the question and answer.

3. I underlined key words and phrases in the answer.

4. I repeated this process for the remainder of interview questions for each of the nine resident interviews.

5. I changed all the interview answers to blue font and left the questions in black font.

6. I printed each color-coded interview protocol with the key words/phrases underlined.

7. I returned to ATLAS.ti and went line by line each interview and highlighted the same key words/phrases using the quote tool.

8. I found that by coding the key words/phrases twice I challenged and evaluated my coding rationale.

9. I annotated any updates to my coding on the printed version.

10. Next, I made a label for each interview question and printed them.

11. Starting with Interview Question 1, I cut out each corresponding question/answer for all nine residents.

12.   I methodically placed each pair of question/answer in a row.

13.   I accounted for each participant by writing the respective participant code on the paper.

14.   On a separate piece of paper, I went down the row and recorded each underlined key word/phrase on one side of the paper.

15.   I verified that I recorded all words/phrases for answers to Question 1.

16.   I reviewed all the key words/phrases again, this time looking for similar themes.

17.   Using different color highlighters, I grouped related or similar words/phrases with the same color.

18.   I repeated this process until all related/similar words were grouped and any anomalies circled.

19.   On the backside of the paper, I synthesized my findings of each grouping of codes into categories. I consciously only used the context provided by the key words and discounted any personal reflections of the respective interviews.

20.   I repeated Steps 1 to 19 for all of the resident interview questions.

After each interview question and the subsequent answers were coded and synthesized, I stapled each packet together. Then I returned to an electronic copy of the interview protocol. Starting with Interview Question 1, I captured the summation of the coded categories. However, I used the original answers to quantify the answers by how many participants fit the aforementioned coded categories. I often used the original

(verbatim) answers to acknowledge that multiple key words could be associated with one participant.

Next, I used the coded categories to identify emerging themes. I began with the suggested aforementioned themes derived from the interview questions: (a) the perceptions of fear following a threat to food security, (b) how the participants feel about their local government's ability to provide assistance when threats to food security exist, (c) the levels of social capital in the community, and (d) the existence of community resilience. The perception of fear theme was determined based on the answers from Questions 1 and 1a. The perception of trust in government assistance/agencies theme was determined based on answers from Questions 2, 2a, 3, 3a, 3b, and 4. Questions 5, 6, 7, 8, 9, and 10 were used to determine the perceptions of social capital theme. Lastly, Questions 11, 12, 13, 14, and 15 determined the perceptions of community resilience theme.

Data analysis process for expert interviews. I took a different approach to analyze the expert interviews. The analysis and coding process of expert interviews was not as extensive due to the various roles and responsibilities of the experts. Nevertheless, I applied the following technique to each expert interview separately, starting in chronological order of the interviews:

1. I read the interview in its entirety.

2. I returned to the first interview question and read the question and answer.

3. I underlined key words and phrases in the answer.

4.   I repeated this process for the remainder of interview questions for each of the six expert interviews.

5.   I printed each interview protocol, which included the answers in blue font with the respective key words/phrases underlined.

6.   I then returned to expert Interview Question 1 and on a separate piece of paper I recorded the synopsis of the answer to Question 1 from each expert.

7.   This allowed me to find any common themes between the experts.

8.   Using my perspective of the resident interviews and my journaling notes, I compared and contrasted the perceptions of the citizens to that of the experts as it pertained to Question 1.

9.   I followed Steps 6 to 8 for all 10 expert interview questions.

10.   I compared and contrasted the actual roles and responsibilities of the experts to the perceived roles and responsibilities noted by the citizens.

11.   I also annotated whether the discrepancy between fact and perception could have been the result of lack of information, lack of communication, or lack of exposure to the respective organizations.

12.   I then returned to ATLAS.ti and inserted my notes in the comment section of the respective expert interview.

Rather than develop themes from the expert interviews, I compared and contrasted the information regarding roles and responsibilities from the experts to the expectations and perceptions expressed by the residents.

Evidence of Trustworthiness

As the researcher of a qualitative study that seeks to examine the insight, perspective, and feelings of the participants it was important to demonstrate how I ensured this study would be credible, transferable, dependable, and confirmable.

Credibility

Before and during the data collection and data analysis phase I used the triangulation strategy (e.g., residents, experts, government documents, and peer-reviewed research) to corroborate my research evidence (Creswell, 2013; Frankfort-Nachmias & Nachmias, 2008; Maxwell, 2013; Miles et al., 2014; Rudestam & Newton, 2007). However, as part of data analysis, it is important to check for researcher effects on the field study (Miles et al., 2014).

For example, when a researcher begins the field study where he or she is an outsider to the environment, the possibility of creating the conditions for social behavior that would not have occurred ordinarily exists (Miles et al., 2014). This change in social behavior could lead the researcher into biased observations and inferences from two perspectives: the effects of the researcher on the case and the effects of the case on the researcher (Miles et al., 2014). Given the dynamics of my field study these two possible sources of bias are worthy of discussion.

The effects of the researcher on the case. This bias occurs when the researcher threatens or disrupts the social and institutional relationships of the environment by his or her presence because people may be curious about who the researcher is, why he or she is there, and how he or she may use the information attained from the field study (Miles et

al., 2014). In this regard, the potential exists for participants to craft their responses to appear amenable, protect their self-interests, mislead the researcher, and/or boycott the interview. In comparison to the dynamics of my field study, I never visited the City of Yuma prior to my field study and my presence was undoubtedly noticed. Furthermore, I was asked from each individual (residents and experts) that I contacted via electronic mail or approached in person about the nature of the research, why I chose Yuma, Arizona, if I had any connections to the city, and/or how I intended to use the information attained.

Nevertheless, the experts from the Fire Department, the Sheriff's Department, the Yuma County Emergency Management Office, the Yuma County Public Health Services, and the Police Department that participated in this study answered all the research questions in a manner that did not verbally or nonverbally suggest they were circumventing questions about their organization's involvement in food security and subsequent responsibilities to the citizens of Yuma following a threat to food security.

The residents that participated in the study seemingly related to the topic of agriculture and potential threats to food and water, as well as my personal goal of attaining a PhD. However, during the weeklong field study, two residents rejected my invitation to participate in the study. The first individual demonstrated significant interest in the topic, why I chose to research threats to agriculture, and the potential implications of my study on social change. However, she declined to participate citing suspicions of how the government and non-specified individuals could perceive her answers. The second individual agreed to participate and scheduled an interview time the following

day, but she cancelled ten minutes after our prescribed time and declined to reschedule the interview without providing a reason.

The effects of the case on the researcher. This bias occurs when the researcher has "gone native," or takes all presentations and discussions presented by the participants at face value without taking an investigative approach (Miles et al., 2014). I assess that some of my initial challenges of establishing rapport (e.g., unfamiliarity with the City of Yuma, no connections to the citizens, and no formal relationships with the experts) prevented me from "going native" and my limited time in Yuma inadvertently forced me to remain focused on the field study. Additionally, I made journal entries at the beginning and end of each day, as well as after each interview to capture my personal feelings about my environment, acknowledge the stress inherent in conducting a field study, account for my plans for each day, and express my interpretation of the interviews. Specifically, while I did not have preconceived impressions about Yuma, the desert landscape reminded me of Sierra Vista, Arizona and I acknowledged my affinity to western Arizona. Additionally, I did not anticipate the feelings of anxiety when conducting the field study, but acknowledging my stress during daily journaling enabled me to put my anxiety in perspective and realize my concerns rested with wanting to maintain the integrity of my dissertation. Lastly, expressing my interpretation of each interview improved my overall perspective of the field study.

Transferability

As a researcher, determining whether or not one's study is transferable to a larger context is paramount. I have established transferability in this study by fully describing

the participant selection criteria, the process for collecting and analyzing data, and the overall environment and demographics of the field study area. Furthermore, my description establishes a detailed evaluation of the study; it also demonstrates that the amount of information attained is adequate and meets the theoretical needs of the study (Miles et al., 2014).

Dependability

To ensure a researcher can conduct this study multiple times, using my journal notes, I have thoroughly explained the coding methodology, the development of coding themes, as well as any modifications to the coding process during data analysis (Creswell, 2009, 2013; Patton, 2002). Furthermore, my thorough description of the coding process and how I interpreted the data improves the overall credibility and legitimacy of the study.

Confirmability

I scrutinized my journal notes and field notes on a regular basis while conducting fieldwork to achieve confirmability. Specifically, I used my observations, journal, and field notes as points of reference during the data collection and data analysis process to ensure I acknowledged personal assumptions, remained objective, and eliminated bias in my work. For example, I compared my field notes and personal thoughts to the analysis to ensure I objectively acknowledged the evidence rather than erroneously made generalized statements and assumptions (Maxwell, 2013; Miles et al., 2014).

Results

I will begin by addressing the themes derived from the resident interview questions: (a) the perceptions of fear following a threat to food security (b) how the residents feel about their local government's ability to provide assistance when threats to food security exist, (c) the perceived levels of social capital in the community, and (d) the perceived existence of community resilience. I will then compare and contrast the expert interviews. This will set the conditions for further discussion in Chapter 5 regarding the interpretation of findings, recommendations, and implications of this study.

The Perception of Fear Following a Threat to Food Security

I developed the perception of fear theme from Interview Questions 1 and 1a. All nine (100%) of the residents believed the greatest threat to themselves and their family following an agro-terrorist attack is access to food and water. For example, residents mentioned gaining access to canned, potted, frozen, and fresh food as concerns, along with the possibility of a surge by citizens to obtain the aforementioned foodstuffs. Additionally, residents expressed concern about the accuracy of determining what food was/was not contaminated due to the supply chain of food and the inherent lapse in time between when the food is harvested, packaged, and shipped to stores/facilities. During the resident interviews, discussion regarding food and water also included the sub-topics of contamination and flow of information, the importance of water, and the susceptibility of chaos and panic (see Figure 3).

Contamination and flow of information. Five out of nine (56%) of the residents also expressed concerns about contaminated food and water and the subsequent

importance of receiving information about the severity of the agro-terrorist attack and regular updates about the level of contamination.

A water shortage is the greatest threat. Two out of nine (22%) of the residents emphasized the importance of water and ranked access to water as their number one concern, followed by food, and then public safety. Both residents stated they could go a couple of days without food but cited government control of water and the water supply and water demand in Arizona as cause for concern because of dependency on water.

Susceptibility of chaos and panic. Two out of nine (22%) residents also expressed concerns that chaos would ensue following an agro-terrorist attack. They questioned when stability would deteriorate if the community had to endure chaos for an undetermined period of time.
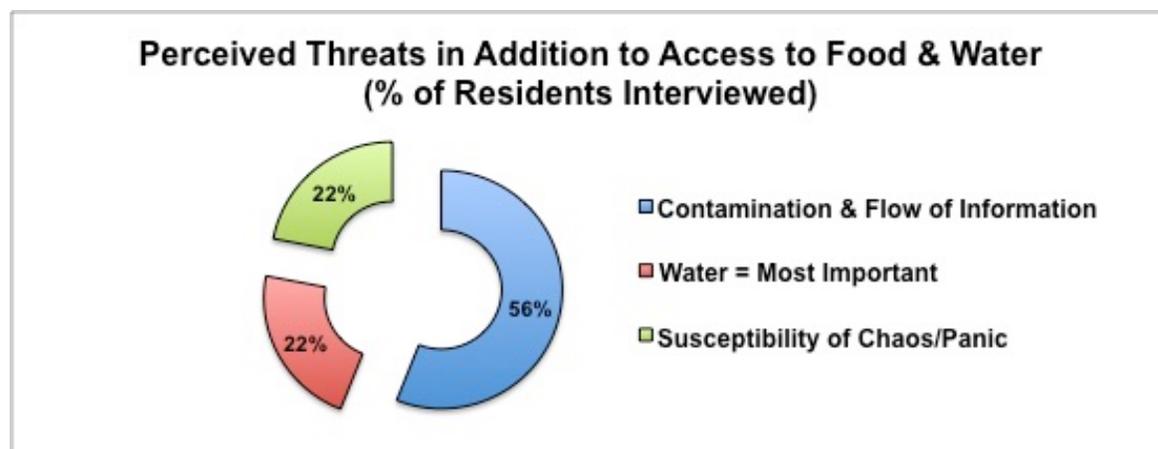

Figure 3. Perceived threats in addition to gaining access to food and water.

Means of protecting oneself and family. In addition to identifying perceived threats to food security, all nine residents expressed multiple considerations for protecting themselves and their family from the threat of accessing food and water. The three main points of discussion were the security of food and water, physically safeguarding their

homes and foodstuffs, and obtaining information from officials and experts.

The Perception of Trust in Government Assistance/Agencies

I developed the perception of trust theme from Interview Questions 2, 2a, 3, 3a, 3b, and 4. In this study, I based the residents' perception of trust on their belief that the respective government agencies would respond to an agro-terrorist attack and provide the requisite assistance regarding food security, protection, and the dissemination of information.

Knowledge of the local government's emergency management plan. Interview Questions 2 and 2a asked residents to explain their local government's emergency management plan in light of an agro-terrorist attack that causes a food shortage and how they would find out if they did not know. All nine (100%) of residents could not say with certainty that a plan existed. Seven out of nine (78%) "did not know" if a plan existed; however, four of the seven expressed an expectation that a plan existed due to the importance of agriculture in Yuma, AZ. The remaining two (22%) residents stated without hesitation "a plan does not exist" within their local government.

The residents named various methods to find information regarding the emergency management plan. Eight out of nine (89%) residents would use social media, the news, and the radio to obtain information; the other resident only noted the importance of information. However, one of the eight residents was skeptical of the accuracy of information on social media and would rely more on the news and radio. Furthermore, four out of the eight preferred direct communication regarding the details of the emergency management plan with local government officials such as the city council

members, the municipal court, the county emergency manager, the police department, the local American Red Cross.

The experts' discussion on an emergency management plan. The experts interviewed did not discuss an emergency management plan specific to an agro-terrorist attack. As noted by experts from the Fire Department, the Sheriff's Office, and the Police Department, an agro-terrorist attack is not a disaster scenario their organizations routinely prepare to confront. In Yuma, the most likely disaster/emergency scenarios include seismic activity, an ammonia leak, and the threat of nuclear fallout from the Palo Verde Nuclear Generating Station in Phoenix, Arizona according to experts from the Yuma Fire Department. In that regard, the experts discussed their routine roles and responsibilities in natural or man-made disasters.

Determining who is responsible for food security. I asked the residents which local and state agencies they believed were responsible for food security during a disaster in Yuma. The participants' answers for this question were inconsistent. All residents named multiple organizations (see Figure 4). There was a lack of consensus on what organization is responsible for food security. After identifying the organizations, the residents were asked, "what do you think they are supposed to do?" Residents shared multiple expectations from these organizations; however, they can be organized into three main themes: (a) evaluating the threat (67% of residents), (b) providing information about the overall security and the status of contamination (56% of residents), and (c) the distribution of food, water, and supplies (22% of residents). While the residents did not coalesce around a general idea of what organization(s) should do, their expectations

centered on the need to assuage their fears. Nevertheless, every mention of FEMA was immediately followed by a disparaging remark about its overall effectiveness such as "they are the worst" and "you can't rely on them," and FEMA's performance after Hurricane Katrina were cited as an example.
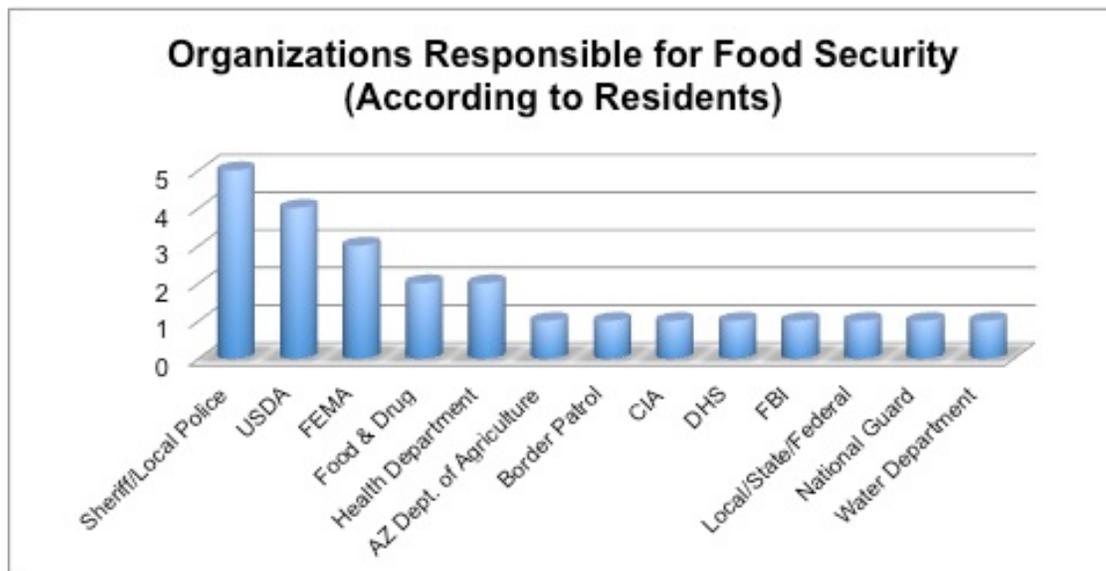

Figure 4. Organizations the residents believe are responsible for food security.

The experts' and their responsibility to food security. Personnel within the Fire Department, the Sheriff's Office, and the County Emergency Management Office do not directly deal with food security. The Health Department expert noted his organization would support [unspecified] state or federal agencies as directed, while the Police Department expert noted the police would conduct investigations or follow any leads regarding a threat to food sources.

Trust in local and state law enforcement to provide assistance. The residents' general consensus when asked, "to what extent do you trust your local and state law enforcement to aid you and your immediate family following an agro-terrorist attack?" is

all of them (100%) trust the local law enforcement to aid them. However, six of the nine (67%) residents expected the assistance of local law enforcement to be delayed because they believed law enforcement personnel would be focused on supporting their own families first. Furthermore the residents were dismissive of the state law enforcement's role in supporting Yuma.

The experts' perspective on providing assistance. All of the experts identified several roles and responsibilities to the citizens of Yuma in the case of an emergency (not specific to an agro-terrorist attack). Overall, the experts discussed the provision of security, coordinating with other organizations/agencies and levels of government, disseminating information regarding the attack and levels of contamination, as well as working within established committees such as Yuma's Local Emergency Planning Committee (LEPC). According to the Emergency Planning and Community Right-to-Know Act (EPCRA), the LEPC is responsible for developing emergency response plans, forming partnerships with stakeholders such as the local government, emergency management services, communities, academia, and industries as a source for enhancing hazardous material preparedness (U.S. Environmental Protection Agency, 2016).

The residents' perception that assistance would be delayed because law enforcement personnel would place priority on taking care of their respective families suggest that residents interviewed for this study were not aware of the "Prepare to Serve" program. Experts from the Fire Department, teach a "Prepare to Serve" program to the City of Yuma employees, Yuma County employees, members of the Chamber of Commerce, and emergency management services (EMS) personnel. The EMS personnel

of Yuma learned a valuable lesson from the Hurricane Katrina disaster in which some EMS personnel did not come to work following the hurricane because of their responsibility to their families. Yuma's "Prepare to Serve" program is widely distributed to EMS personnel and emphasizes the importance of public servants ensuring their families are prepared so they can answer the call and attend to the business of restoring basic services and operations for the citizens of Yuma.

The Perception of Social Capital

I developed the theme perception of social capital from Interview Questions 5-10. The residents' perception of social capital was evaluated based on their relationships with neighbors, their feeling of belonging in their community, their trust in neighbors following an agro-terrorist attack, and how they would protect their family following an attack.

Relationship with neighbors and community. Although seven out of nine (78%) residents do not interact regularly with their neighbors -- mostly due to work obligations -- eight out of nine (89%) residents believe their neighbors are cordial, friendly, and trustworthy. Only one resident (11%) believes her neighbor is not friendly. Furthermore, when asked how often residents do favors for their neighbors such as watching each other's children, lending tools, or helping with daily requirements/chores, eight out of nine (89%) residents stated "not very much," "not often," or "rarely." Only one resident (11%) had daily interactions with his neighbors. However, when asked to what degree they believed there was a sense of belonging in the community, seven out of nine (78%) noted a "good" to "strong sense" of belonging in the community. The

remaining two (22%) residents noted a "small degree of belonging," due to a lack of socializing with neighbors. They also noted that work prevented them from interacting with neighbors.

Level of trust after an agro-terrorist attack. It is important to note that while the majority of residents believed their neighbors were friendly, and believed there was a good/strong sense of community, the residents' level of trust in neighbors changed after they were asked to posit an agro-terrorist attack occurred and a food shortage ensued. When assessing their trust in neighbors after an attack, 22% of residents believed "some may act out" or "become a threat." Furthermore, 45% of residents believed their neighbors "may focus on self-sustainment more than being neighborly," "would not share their food," would "be unhelpful but nonthreatening," and would "become more selfish." The remaining 33% of residents trust their neighbors (see Figure 5). Along that same vein, when asked how they would protect themselves and their family following an agro-terrorist attack and the threat of a food shortage residents focused primarily on physical security and rationing food (see Figure 6). Of note, none of the residents interviewed reference the 72-hour emergency kit discussed by several experts interviewed during this study.
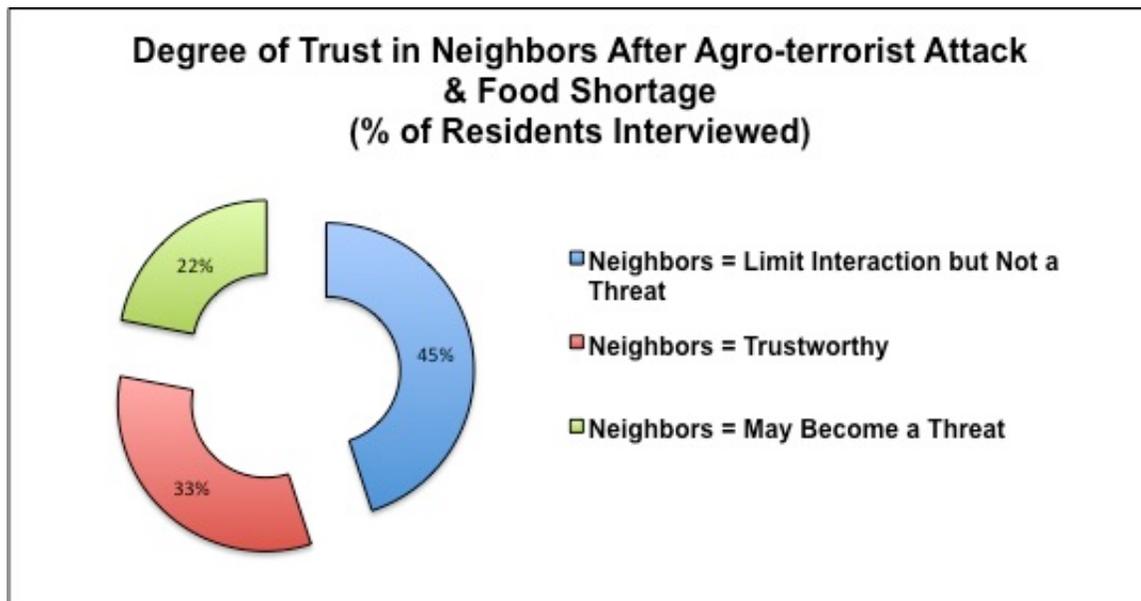
*Figure 5.* Degree of trust in neighbors after an agro-terrorist attack and food shortage.
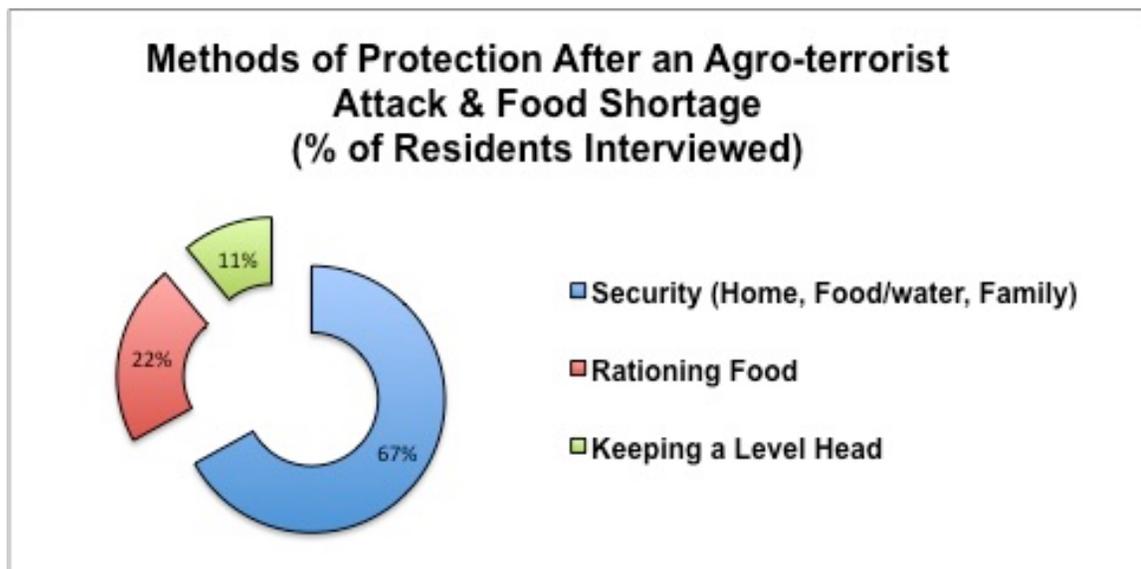
Figure 6. Residents' method of protection after an agro-terrorist attack

Established educational programs to improve social capital. During the interviews of all six experts I learned that each respective organization focused on educating the public with an emphasis on the importance of self-sustainment during a natural or man-made disaster or emergency. Specifically, experts from the Fire Department, Sheriff's Office, and the County Emergency Management Office referenced the Family Disaster Plan and Personal Survival Guide (FDPPSG), commonly referred to by the experts as the 72-hour emergency kit (see Figure 7). This guide addresses annual family meetings; how to shut off certain utilities; a list of home emergency supplies and equipment; training in first aid; how to respond to an earthquake; and, how to practice the family emergency plan. The Health Department participates in Health Fairs and disseminates information via outreach, training, and published information, while the Police Department works in tandem with EMS as in community emergency response.
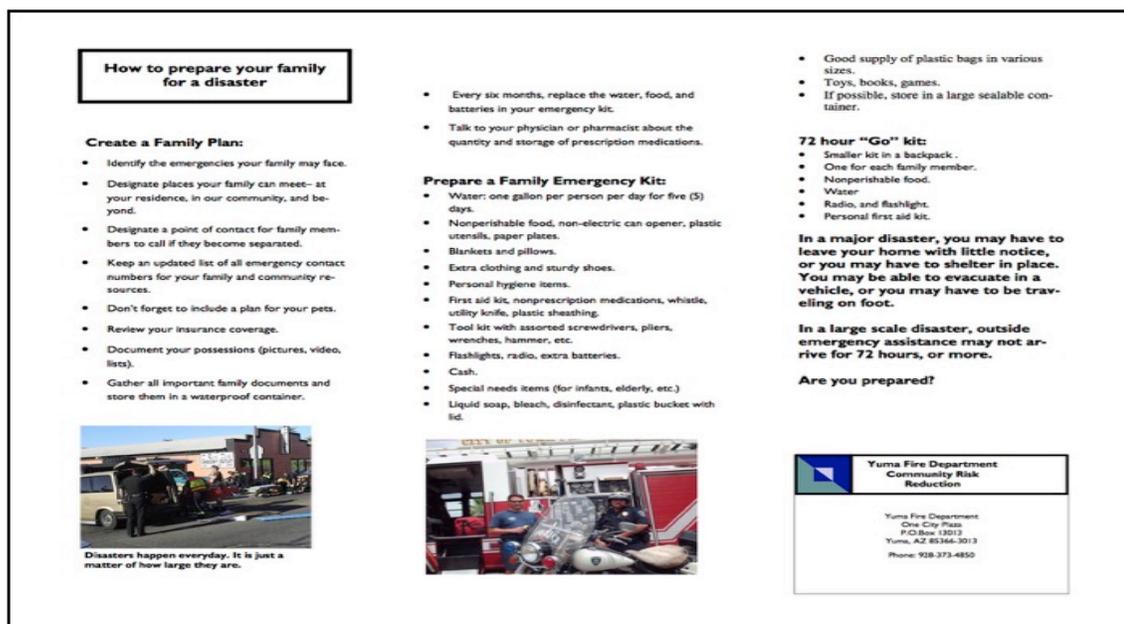
Figure 7. Pamphlet referencing the FDPPSG and the 72-hour kit.

The Perception of Community Resilience

I developed the theme perception of community resilience from Interview

Questions 12-15 (see Appendix A). The residents' perception of community resilience

was evaluated based on who they identified as community leaders and the leaders'

perceived effectiveness, their participation in community events, and their opinion on

whether or not their community could endure a large-scale disaster like an agro-terrorist

attack that threatened the food supply.

Identified community leaders. When asked, "who do you identify as the leaders

within your community" eight out of nine residents (89%) provided at least two

individuals/entities and one resident (11%) could not think of any. The perceived leaders

within communities varied (see Figure 8). The eight residents that named community

leaders believed those leaders would listen to the residents. The same resident that could

not name a community leader believed "the situation would dictate whether or not

community leaders would listen" to the residents.
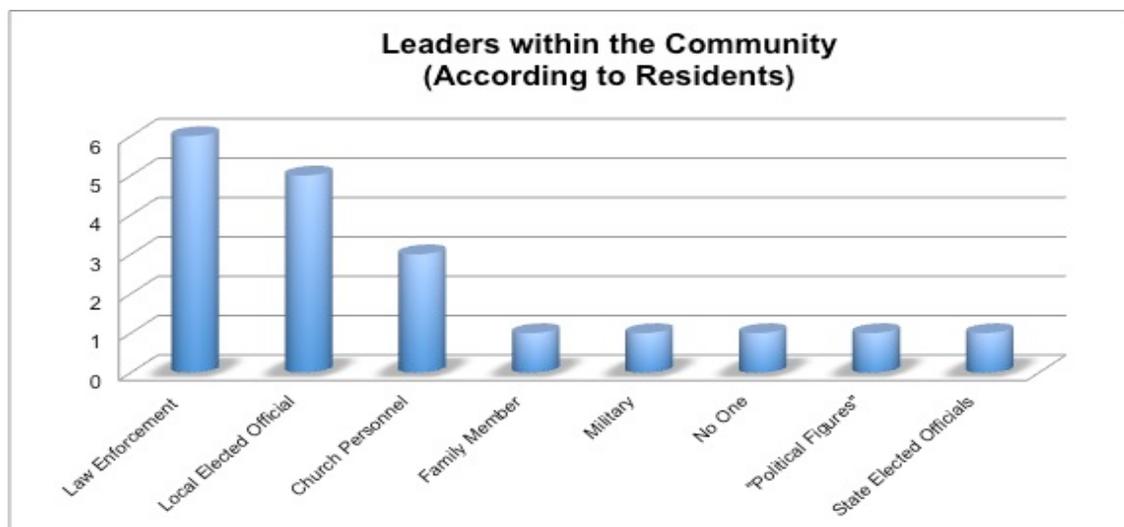
Figure 8. Individuals or entities that residents named as community leaders.

Participation in community events. Despite the aforementioned limited
neighbor-to-neighbor daily interaction, the residents participate in community events
such as Lettuce Days, the Farmers Market, the Taco Festival, Tip a Cop events at a local
restaurant, rodeos, volunteer efforts at the local hospital, locally organized races, and
meet and greets with local officials. Over half of the residents periodically participate in
community events (at least 1 to 2 times per year); three of the nine residents regularly
participate (at least once a month or once a quarter); and, one resident--the same
individual that said he is not social--does not participate in community events (see Figure
9).
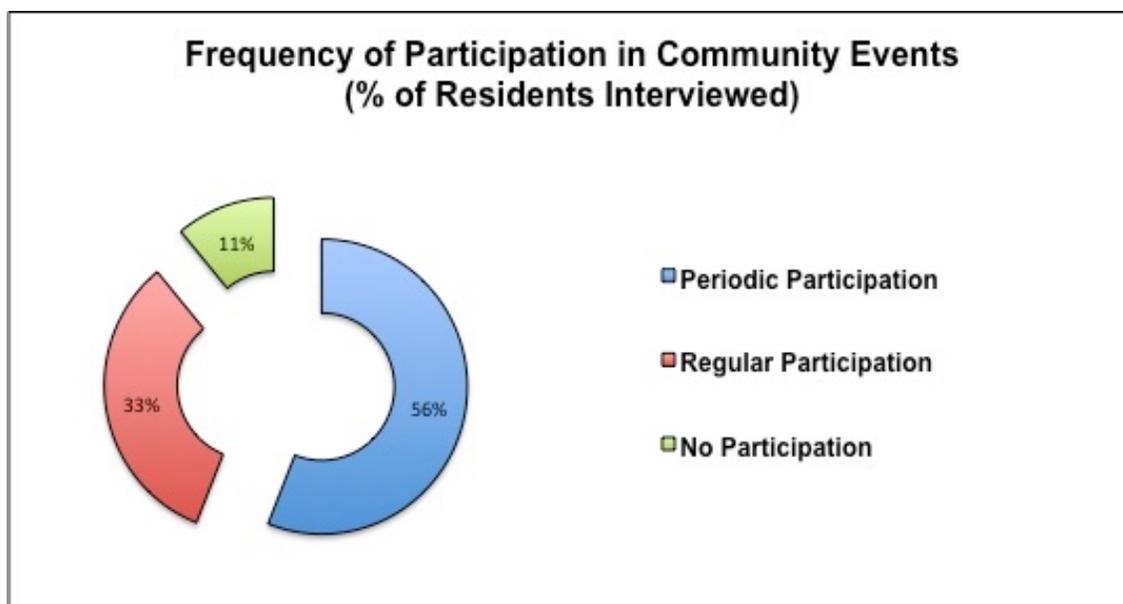
Figure 9. Frequency of participation in community events by residents.

Belief that the community could endure a large-scale disaster. The last
interview question for the residents asked participants if they believed their community
could endure an agro-terrorist attack that threatened the food supply. The majority of the
residents (67%) expressed certainty that the community could endure such an attack.

They cited Yuma's "unique" sense of community and culture. Specifically, residents commented that the City of Yuma "is small, but very strong," "resilient," "has a shared desire to make the community better," "is big enough to have everything a large city has, but small enough to make a difference," and "is a big town, with a small town mentality." The remaining residents (33%) expressed uncertainty due to unknowns. They expressed hope that the community could pull together, but noted the uncertainty of an agro-terrorist attack and subsequent food shortage, along with the potential duration of the threat would affect the community's ability to pull together.

The experts' perception on community resilience. When asked, "do you think the citizens of Yuma function as a community?" and the follow-up question "would they pull together if a threat to food security exists?" All six of the experts answered "yes" to both questions; however, three experts acknowledged the dynamics of the population change in the winter when "the population nearly triples." Despite the increase in population during the winter, experts shared the belief that Yuma is unique. Specifically, experts highlighted that Yuma is three hours away from Phoenix, Arizona (to the east) and San Diego, California (to the west). Experts commented, "Yuma has a bit of a frontier mentality," "its hours away from outside assistance," "the community consists of a retired military community," "people take care of one another," and "has a strong sense of community and there have been numerous examples of people coming together to support one another."

Summary

In this chapter, I provided a comprehensive examination and analysis of the themes derived from resident interview questions: (a) the perceptions of fear following a threat to food security, (b) how the residents feel about their local government's ability to provide assistance when threats to food security exists, (c) the perceived levels of social capital in the community, and (d) the perceived existence of community resilience. This chapter has also provided a comparison between residents' perception and that of the experts. Moreover, using the results of this qualitative ethnographic case study I have explored the central research question: "What are the perceived threats to food security in an agricultural community in Arizona and the possible responses to food shortages following a hypothetical agro-terrorist attack on the U.S. food supply?" I also explored the subquestions: "To what extent do the citizens of Yuma, Arizona believe their local government can provide assistance when a threat to food security exists?" and "To what extent does community resilience within Yuma, Arizona affect possible responses to food shortages?" In Chapter 5 I will summarize my key findings, interpret said findings, and analyze them in the context of the theoretical framework of this study.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

In this qualitative ethnographic case study, I examined, described, and analyzed the perceived threats to food security and the possible responses to food shortages in an agricultural community in Yuma, Arizona, based on a hypothetical agro-terrorist attack on the U.S. food supply. The specific problem addressed in this study is the lack of federal, state, or local government plans to mitigate the public's possible responses to a perceived threat to food security. In this chapter, I interpret the findings of this study, capture the overall limitations, provide recommendations for future research, and describe the potential impacts for positive social change.

Interpretation of the Findings

In discussing the key findings, I highlight several themes and reiterate some of the points of discussion in Chapter 2 and Chapter 4, such as (a) the lack of federal, state, or local government plans to mitigate responses to a food shortage following an agro-terrorist attack, (b) social capital theory and the perceived levels of social capital in Yuma, (c) community resilience and the perceived existence of community resilience in Yuma, and (d) the whole community approach to emergency preparedness and management.

A Plan Does Not Exist

Experts clearly demonstrated that Yuma, Arizona has developed and integrated an emergency management plan to address the most common natural and man-made disasters. However, an agro-terrorist attack is not a disaster scenario for which their

organizations routinely prepare. Moreover, when asked specifically about a plan to address agro-terrorism and a possible food shortage following an agro-terrorist attack, both experts and residents could not identify a specific federal, state, or local government plan. The lack of a plan directly correlates to the potential severity of impacts beyond the agricultural community to include disrupting the economy, undermining the confidence in the local government, and challenging the resilience of the community (Appel, 2013; Chalk, 2004; Gill, 2015; Gyles, 2010; Monke, 2007; Olson, 2012; Rohn & Erez, 2013; U.S. GAO, 2011a, 2011b).

Interpreting Social Capital

The concept of social capital theory encompasses three types of social capital: bonding, bridging, and linking (Elliott et al., 2010; Hawkins & Maurer, 2010; Norris et al., 2008; Putnam, 2000; Rostilla, 2011). In this study, I researched bonding social capital (cooperative and trusting relationships between members of a network such as a community); however, I also noted that before, during, and after disasters, all three types of social capital often influence the relationships within a community (Aldrich & Meyer, 2015; Chamlee-Wright & Storr, 2011; Elliott et al., 2010; Hausman et al., 2007; Hawkins & Maurer, 2010; Reininger et al., 2013).

Bonding, bridging, and linking social capital. The resident and expert interviews demonstrated how bonding, bridging, and linking social capital influence the community. Bridging social capital describes an outward-oriented network where individuals recognize their diversity (Hawkins & Maurer, 2010; Rostilla, 2011). For example, residents and experts noted that the community works together because of

participants' common sense of living in a "small" and "unique" town. One resident also opined that economic and ethnic diversity within Yuma is more accepted than his small hometown in the northeastern United States. Linking social capital describes the extent to which individuals build relationships with organizations, institutions, and individuals that yield power and influence (Hawkins & Maurer, 2010; Rostilla, 2011). For example, one resident and one expert each noted that several agricultural businesses within Yuma, such as Tanimura & Antle Incorporated and Foothills Packing Company, have regional branches and others, such as Gowan Company, have international branches.

Nevertheless, these businesses remain invested in the community of Yuma, Arizona. This resident noted that while some agricultural businesses are "fierce competitors," they maintain a concerted effort to invest in agricultural efforts within Yuma because it "serves the greater good." Another resident reflected on the close relationship that the owner of a franchise restaurant maintains with the community. Furthermore, a third resident really appreciated the Tip a Cop fundraiser, noting that it demonstrates the Police Department wants to get to know and maintain a connection with the community. Lastly, a fourth resident praised the mayor for his continued effort to "work with the community" by hosting a local fundraiser at a restaurant.

The possibility of a breakdown in society. As noted by Durkheim (1984) and Merton (1968), a breakdown in societal bonds will lead to a decline of common rules and values, which will lead to unstable conditions, confusion, and ultimately conflict. Previously, I suggested that citizens of an agriculturally significant city who experienced an agro-terrorist attack and were subsequently disappointed in the government's response

could become rebellious if the community experienced low social capital or if social

capital was nonexistent. In this field study, the residents of Yuma demonstrated

characteristics of high social capital such as trust in their neighbors, trust of government

officials and responders, and community solidarity. Moreover, eight out of nine residents

trusted their neighbors to varying degrees and believed the government leaders, law

enforcement, and emergency management professionals would provide assistance.

However, during the field study, residents demonstrated a lack of knowledge,

mismanaged expectations, and confusion that if left unaddressed could cause a

breakdown (albeit temporary) in society.

    Analyzing the metrics of anomie. When social scientist Srole (1956) attempted to

develop a scale of anomie he focused on five items that could affect an individual's

perception of his/her social environment: (a) the perception that community leaders are

indifferent to one's needs, (b) the perception that little can be accomplished in a society

that is unpredictable and out of order, (c) the perception that life-goals are receding rather

than being realized, (d) a sense of futility, and (e) the conviction that one cannot count on

personal associates for social and psychological support (Merton, 1968, p. 164).

    Four out of five of these items could be manifest from the lack of knowledge,

mismanaged expectations, and confusion expressed by some of the residents during the

field study when answering Interview Questions 2, 2a, 3, 3a, 4, 9, and 10. For example,

regarding Item 1 (perception that community leaders are indifferent to the needs of

citizens), none of the residents knew if a plan existed to respond to an agro-terrorist

attack, but 57% of respondents expected a plan to exist because agriculture is important

in Yuma. Additionally, residents did not demonstrate a clear understanding of which organizations were responsible for food security. Furthermore, 56% of the residents also believed that receiving information about the severity of the agro-terrorist attack and regular updates about the level of contamination was directly related to their perceived threats of a food shortage. Regarding Item 2 (the perception that little can be accomplished in a society that is unpredictable and out of order), 22% of residents worried that chaos would ensue following an agro-terrorist attack. They expressed concern whether stability would deteriorate if the community had to endure chaos for an undetermined period of time. Residents demonstrated Item 3 (the perception that life-goals are receding rather than being realized) when they all expressed the greatest threat to themselves and their family was the ability to access food and water and physically secure their stock of food and water. Lastly, regarding Item 5 (the conviction that one cannot count on personal associates for social and psychological support), although 89% of the residents believed their neighbors were friendly, cordial, and trustworthy, only 33% of them noted they would still trust their neighbors after an agro-terrorist attack and a food shortage ensued.

The Dynamics of Community Resilience

Social capital and community resilience are key components of establishing strong community bonds and stable communities that are capable of responding to and recovering from natural and man-made disasters (Aldrich & Meyer, 2015; Brose, 2015; Chamlee-Wright & Storr, 2009; Coleman, 1990; Hyvarinen & Vos, 2015; Kulig et al., 2013; Linnell, 2014; McCrea et al., 2014; Meesters et al., 2014; Norris et al., 2008;

Plodenic et al., 2014; Putnam, 1995). In this study, I used the IPCR to establish interview questions to measure the perceived level of community resilience, and that process was an effective means of measuring perceived community resilience in Yuma, Arizona.

However, acknowledging the challenges of individuals in balancing home life, community socialization, and work responsibilities in society is paramount to enabling community resilience, establishing social networks, and facilitating routine communication between members of a community. For example, 78% of the residents identified work as the reason they did not regularly interact with their neighbors, while 56% of the residents noted they only periodically participated in community events because of work. In the case of Yuma residents, 67% identified themselves, their community, and the city of Yuma as being resilient because of the fundamental investment in their community. In turn, 100% of the experts agreed that communities in Yuma are resilient.

While the participants of the study believed the community of Yuma is resilient, 50% of experts acknowledged that the increased population during the winter months presented uncertainty because of the influx of people who may not share the same perceptions about community relations and a sense of belonging in Yuma. Essentially, despite the strong perception of community resilience among the permanent residents of Yuma, the inclusion of visitors and seasonal workers with disparate perceptions of social capital and community resilience could inevitably create emergency management, preparedness, and response challenges within Yuma during natural and man-made disasters.

From Concept to Application: The Whole Community Approach

A *whole community* approach is one of the pillars of emergency management, and it enables a shared understanding and sense of empowerment among residents, emergency management professionals, community leaders, stakeholders, and government officials regarding the needs of a community (FEMA, 2011; Plodenic et al., 2014; U.S. DHS, 2010a, 2014a). Inherent in the whole community approach is the implementation of educational processes, such as seminars for the public, the integration of resources throughout the community, and individual and collective preparedness. However, this approach also requires the building of relationships, consistent communication between the public and the government, and community competence (Norris et al., 2008).

In this study, 100% of the residents could not explain their local government's emergency management plan, and when three of the residents discussed FEMA, they shared derogatory comments regarding its effectiveness. Additionally, none of the residents mentioned the 72-hour emergency preparedness kit despite the efforts by the Yuma Fire Department, the Yuma Sheriff's Office, and the Yuma County Emergency Management Office to educate the public. Moreover, when discussing emergency management, 67% of the residents anticipated the assistance of local law enforcement to be delayed because they were not aware of the Prepare to Serve program (see p. 99). The distrust of FEMA, the lack of discussion about the 72-hour kit, and the expectation that support would be delayed suggests a lack of knowledge about emergency management procedures and resources among the residents interviewed. As noted previously, community competence is based on social trust, communication, and the existence of

resources and networks. Community competence enables individuals within a community to take collective action and make informed decisions before, during, and after a disaster (FEMA, 2011; McCrea et al., 2014; Norris et al., 2008; Plodenic et al., 2014; U.S. DHS, 2010b, 2014a). Although the perception of social trust among residents of Yuma has been identified, the lack of knowledge about resources and networks among the residents suggests there could be a deficit in community competence, which could negatively affect the residents' ability to make informed decisions during and after an agro-terrorist attack that threatens food security. Ultimately, educating the residents about emergency management and preparedness procedures may improve whole community approach initiatives in Yuma, Arizona.

Delimitations of the Study

This study was limited to the perspective of nine residents and six experts of Yuma, Arizona. Citizens residing in other agriculturally significant areas within the United States (and abroad) may offer disparate views regarding the perceived threat to food security and possible food shortages following a hypothetical agro-terrorist attack. Additionally, my field study occurred in the middle of June 2016. Therefore, the large population of migrant agricultural workers and corporate representation from regional agricultural companies that were present in Yuma during the November-March harvest season had left Yuma, Arizona to harvest crops in California.

Limitation of the Study

I wanted to include expert interviews from the Yuma Department of Agriculture, the Yuma County Water Users Association, and the Yuma Branch of the American Red

Cross. However, I did not receive a response from representatives of those organizations despite my correspondence via mail, email, and/or phone calls.

Recommendations for Future Research

The information gleaned from research and the field study suggests that Yuma, Arizona has a good foundation of social capital, community resilience, and emergency management and preparedness. However, future research on this topic should expand the focus of this study.

In this study, I focused on the year-round residents of Yuma, Arizona. However, future researchers should increase the number of participants to include residents who visit during the winter months to account for the potential effect that human mobility has on social capital, community resilience, and the whole community approach to emergency management and preparedness. Additionally, I interviewed nine residents and six experts and although I reached saturation, future researchers should include more residents and experts (especially experts from organizations who are directly involved in Yuma's emergency management program such as the American Red Cross). It is possible that an increased research population could yield disparate perceptions about threats to food security and possible responses following an agro-terrorist attack. Lastly, comparing the tenets of social capital and community resilience in Yuma to another agriculturally significant city that is not as isolated, as Yuma could yield additional perspectives on social capital theory, community resilience, and the whole community approach to emergency management.

Implications

In this study, I identified an underresearched element of homeland security and threats to agriculture that could assist emergency managers at all levels of government and improve the ability of U.S. citizens to be protected against a man-made disaster. The results of this study may assist the government officials in Yuma, Arizona identify positive aspects of social capital and community resilience in their city, manage the expectations of citizens during disasters, improve communication between government officials and citizens, and incorporate emergency management plans to account for a potential agro-terrorist attack.

The bulk of recommendations involve using additional techniques and venues to leverage the perceived community resilience and social capital to improve communication, education, and expectation management, using both social media and community events. According to experts from the fire department, residents follow the Yuma Fire Department's Twitter page to stay abreast of information. The City of Yuma could leverage radio, television, and the social media to improve the flow of information and communication to the residents, which could subsequently improve the citizens' expectations of the duties and responsibilities of emergency management personnel.

Develop Active Participation in Emergency Management

Residents and experts discussed the use of radio, television, and social media to provide information during this hypothetical agro-terrorist attack. However, part of establishing a comprehensive plan for emergency management and preparedness involves setting conditions prior to an emergency through education and training. Specifically, the

City of Yuma residents could leverage the current lines of communication (e.g., Twitter and Facebook pages of local government departments, as well as the local television and radio channels) to initiate a "Did You Know" trivia campaign. In addition to the trivia campaign, emergency management and preparedness experts could also explain the concept of a primary, alternate, contingency, and emergency (PACE) program to citizens and help them establish a personalized and/or family response plan.

Establish a "Did You Know" trivia campaign. The trivia campaign could include information about the actual roles and responsibilities of those organizations identified by the residents of this study as well as other organizations not identified that support emergency management. The campaign could also include information about the purpose of the CERT and LEPC programs, the 72-hour emergency kit, as well as the Prepare to Serve program. The topics could change weekly or monthly. Moreover, the trivia campaign could serve as launch points for upcoming community events. For example, during Lettuce Days or the Taco Festival members of the LEPC could host the trivia campaign at their respective booth. In addition to providing tote bags, magnets, or flyers to citizens, the local stakeholders such as the aforementioned agriculture businesses could sponsor a modest gift for citizens that answer a select number of trivia questions correctly.

Establish a PACE plan. While the Yuma Fire Department has established a Family Disaster Plan and Personal Survival Guide, I recommend using community events to help citizens develop an emergency management PACE plan. The development of the plan could include thought provoking questions such as "what if your first plan fails?"

These questions should prompt citizens to provide adequate thought to their emergency plan as well as contingencies. The respective emergency management and preparedness professionals should be there to advise the citizens. This process could establish a line of communication between experts and residents, develop a sense of trust, and demonstrate the importance of each citizen's role in emergency management and preparedness.

Include the occasional "black swan" scenario. The experts interviewed in this study demonstrated they are prepared to respond to natural and man-made disasters that are considered normal for Yuma, Arizona. However, I believe that incorporating the occasional *black swan* (Holdeman, 2011; Taleb, 2007;) scenario into the regularly scheduled emergency management Tabletop Exercise could encourage creative and critical thinking, limit complacency, and reinforce the importance of local, state, and federal emergency management collaboration. Both experts and residents acknowledged that residents of Yuma maintain a *frontier mentality* because it is three hours away from major cities. That mentality serves as a forcing function of extensive collaboration and high social capital among local entities and communities. However, occasional black swan scenarios, such as an agro-terrorist attack, that emphasize local, state, and federal coordination could ensure the citizens of Yuma avoid the potentially negative aspects of high social capital such as social exclusion (Hawkins & Maurer, 2010; Portes, 1998).

Conclusion

The 9-11 attacks forced the U.S. government to reevaluate vulnerabilities in homeland security and homeland defense. The majority of post-9-11 government responses involved the passing of legislation to: (a) identify vulnerabilities, (b) improve

interagency collaboration and coordination; and, (c) emphasize the role that citizens assume during and after a disaster is paramount to efficient emergency response (Caudle, 2012; FEMA, 2010; S.3721, 2006; Office of Homeland Security, 2002; Pub. L. No 107-296, 2002; U.S. DHS, 2003a, 2003b, 2004, 2007, 2010a, 2010b, 2011a, 2011b; U.S. GAO, 2015, 2016a, 2016b). One of the most important, yet underresearched vulnerabilities to U.S. homeland security and defense is the threat of a large-scale attack against agriculture because of the subsequent economic and social implications. In this study I addressed the lack of federal, state, or local government plans to mitigate the public's response to an attack on agriculture.

The purpose of this qualitative ethnographic case study was to examine, describe, and analyze the perceived threats to food security and the possible responses to food shortages in an agricultural community following an agro-terrorist attack on the U.S. food supply. Using the theoretical framework of social capital theory, I examined the complexity of human reactions to the threat to food security and the possibility of a food shortage. I also identified the extent to which citizens of Yuma believed their local government could provide assistance when a threat to food security exists. Moreover, I identified the extent to which community resilience within Yuma, Arizona would affect possible responses to food shortages. The results of this study may provide government officials in Yuma with methods for improving education and communication on emergency management and preparedness programs. Additionally, this study may lead to future research on the relationship between social capital, community resilience, and emergency management and preparedness in other U.S. cities.

References

Adams, J. A. (2013). When the lights go out. *Economic Development Journal*, *12*(3), 49-56. Retrieved from http://search.proquest.com.ezp.waldenulibrary.org/docview/1504545072?accounti d=14872

Aldrich, D. P. (2010). Fixing recovery: Social capital in post-crisis resilience. *Journal of Homeland Security, 6,* 1-10. Retrieved from http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1002&context=pspubs

Aldrich, D. P., & Meyer, M. A. (2015). Social capital and community resilience. *American Behavioral Scientist*, *59*(2), 254-269. doi:10.1177/0002764214550299

American College of Physicians. (2014). Smart medicine. Retrieved from http://smartmedicine.acponline.org/searchresults.aspx#q=bioterrorism

Appel, B. (2013). A multidisciplinary approach to increasing preparedness against bioterrorism. *Biosecurity and Bioterrorism. Biodefense Strategy, Practice, and Science, 11*(S1), S1-S2. doi:10.1089/bsp.2013.0861

Bourdieu, P. (1984 [1979]). *Distinction*. Cambridge, England: Harvard University Press.

Bourdieu, P. (1985). The forms of capital. In J. G. Richardson(Ed.), *Handbook of theory and research for sociology of education*. New York, NY: Greenwood.

Brose, D. (2015). *Developing a framework for measuring community resilience: Summary of a workshop.* Washington, D.C. National Acadamies Press.

Brown, D., & Kulig, J. (1996, 1997). The concept of resiliency: Theoretical lessons from community research. *Health and Canadian Society, 4*, 29–52.

Bruneau, M., Chang, S., Eguchi, R., Lee, G., O'Rourke, T., & Reinhorn, A. (2003). A framework to quantitatively assess and enhance the seismic resilience of communities. *Earthquake Spectra, 19*, 733–752.

Bruzzone, A. G., Longo, F., Massei, M., Nicoletti, L., & Agresta, M. (2014). Safety and security in fresh good supply chain. *International Journal of Food Engineering*, *10*(4), 545-556. doi:10.1515/ijfe-2014-0020

Bureau of Labor Statistics. (2015). Unemployment rates for Metropolitan Areas. Retrieved from http://www.bls.gov/web/metro/laummtrk.htm

Bush, G. W. (2002). Securing the homeland: Strengthening the nation. Retrieved from http://www.dhs.gov/xlibrary/assets/homeland_security_book.pdf

Cafiero, C., Melgar-Quiñonez, H. R., Ballard, T. J., & Kepple, A. W. (2014). Validity and reliability of food security measures. *Annals of the New York Academy of Sciences*, *1331*(1), 230-248. doi:10.1111/nyas.12594

Canton, L. G. (2007). *Emergency management: Concepts and strategies for effective programs*. Hoboken, NJ: John Wiley & Sons, Inc.

Caudle, S. (2012). Homeland security: Advancing the national strategic position. *Homeland Security Affairs*, *8*(1), 1-17.

Center for Disease Control. (2003). Nicotine poisoning after ingestion of contaminated ground beef --- Michigan, 2003. *Morbidity and Mortality Weekly Report, 52*(18), 413-416. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5218a3.htm

Centers for Disease Control and Prevention. (2013). About NORS. Retrieved from

http://www.cdc.gov/nors/about.html

Centers for Disease Control and Prevention. (2015). Timeline of reporting cases of

Salmonella infection. Retrieved from http://www.cdc.gov/salmonella/reporting-

timeline.html

Chalk, P. (2004). Hitting America's soft underbelly: The potential threat of deliberate

biological attacks against the U.S. agricultural and food industry. Retrieved from

http://www.rand.org/content/dam/rand/pubs/monographs/2004/RAND_MG135.p

df

Chamlee-Wright, E. & Storr, V. H. (2009). Club goods and post-disaster community

return. *Rationality and Society*, *21*(4), 429–558. doi: 10.1177/1043463109337097

Chamlee-Wright, E., & Storr, V. H. (2011). Social capital as collective narratives and

post-disaster community recovery. *Sociological Review*, *59*(2), 266-282.

doi:10.1111/j.1467-954X.2011.02008.x

Chatham House. (2014). Food security: Mapping risks, building resilience. Retrieved

from http://www.chathamhouse.org/conferences/foodsecurity2014

Chen, J., Chen, T. Y., Vertinsky, I., Yumagulova, L., & Park, C. (2013). Public-private

partnerships for the development of disaster resilient communities. *Journal of

Contingencies & Crisis Management*, *21*(3), 130-143. doi:10.1111/1468-

5973.12021

Chomel, B., & Sun, B. (n.d). Bioterrorism and invasive species. *Revue Scientifique Et Technique-Office International Des Epizooties*, *29*(2), 193-199. Retrieved from http://dx.doi.org/10.20506/rst.29.2.1977

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology, 94*, S95–S120. Retrieved from http://www.jstor.org/stable/2780243

Crenshaw, M. (2005). *Terrorism in context* (3rd ed.). University Park, PA: Pennsylvania State University Press.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches*. (3rd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Cutter, S. L., Barnes, L., Berry, M., Burton, C. G., Evans, E., Tate, E. C., & Webb, J. (2008a). *Community and regional resilience: Perspectives form hazards, disasters and emergency management*. CARRI Research Report 1. Oak Ridge. Community and Regional Resilience Institute. Retrieved from http://www.resilientus.org/wp-content/uploads/2013/03/FINAL_CUTTER_9-25-08_1223482309.pdf

Cutter, S. L., Barnes, L., Berry, M., Burton, C., Evans, E., Tate, E., & Webb, J. (2008b). A place-based model for understanding community resilience to natural disasters. *Global Environmental Change, 18*, 598–606. doi:10.1016/j.gloenvcha.2008.07.013

Darra, S. (2006). Emotion work and the ethics of novice insider research. *Journal of Research in Nursing, 13*(3), 251-261. doi: 10.1177/1744987107085119

Denzin, N. K., & Lincoln, Y. S. (2005). *The Sage handbook of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.

Dowling, M. (2006). Approaches to reflexivity in qualitative research. *Nurse Researcher, 13*(3), 7-21. Retrieved from http://dx.doi.org/10.7748/nr2006.04.13.3.7.c5975.

Elbers, A., & Knutsson, R. (2013). Agroterrrorism targeting livestock: A review with a focus on early detection systems. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science*, *11*(S1), S25-S35. doi:10.1089/bsp.2012.0068

Elliott, J. R., Haney, T. J., & Sams-Abiodun, P. (2010). Limits to social capital: Comparing network assistance in two New Orleans neighborhoods devastated by Hurricane Katrina. *Sociological Quarterly, (4),* 624. doi:10.1111/j.1533-8525.2010.01186.x

Farazmand, A. (2007). Learning from the Katrina crisis: A global and international perspective with implications for future crisis management. *Public Administration Review, 67*(S1), 149-159. doi: 10.1111/j.1540-6210.2007.00824.x

Federal Emergency Management Agency. (2011). A whole community approach to emergency management: Principles, themes, and pathways for action. Retrieved from https://s3-us-gov-west-1.amazonaws.com/dam-production/uploads/20130726-1813-25045-0649/whole_community_dec2011_2_.pdf

Federal Emergency Management Agency. (2014). About citizen corps. Retrieved from http://www.ready.gov/about-citizen-corps

Federal Emergency Management Act. (2008). Emergency support function annexes:

Introduction. Retrieved from http://www.fema.gov/media-library-data/20130726-1825-25045-0604/emergency_support_function_annexes_introduction_2008_.pdf

Federal Emergency Management Agency. (2009). Mitigation. Retrieved from http://www.fema.gov/what-mitigation.

Federal Emergency Management Agency. (2010). The Federal Emergency Management Agency publication 1. Retrieved from https://www.fema.gov/pdf/about/pub1.pdf

Fischetti, M. (2007). Is your food contaminated? *Scientific American, 297*, 112-117. doi:10.1038/scientificamerican0907-112

Food and Agriculture Organization of the United Nations (FAO). (2014). Food security statistics. Retrieved from http://www.fao.org/economic/ess/ess-fs/en/

Frankfort-Nachmias, C., & Nachmias, D. (2008). *Research methods in the social sciences* (7th ed.). New York, NY: Worth.

Gierlach, E., Belsher, B. E., & Beutler, L. E. (2010). Cross-cultural differences in risk perceptions of disasters. *Risk Analysis, 30*(10), 1539-1549. doi: 10.1111/j.1539-6924.2010.01451.x

Gill, K. M. (2015). Agroterrorism: The risks to the United States food supply and national security. *U.S. Army Medical Department Journal*, 9-15.

Gin, J. L., Stein, J. A., Heslin, K. C., & Dobalian, A. (2014). Responding to risk: Awareness and action after the September 11, 2001 terrorist attacks. *Safety Science, 65,* 86-99. doi: 10.1016/j.ssci.2014.01.001

Glanville, J. L., Andersson, M. A., & Paxton, P. M. (2013). Do social connections create trust? An examination using new longitudinal data. *Social Forces*, *2*(545). doi: 10.1093/sf/sot079

Glaze, J. (2002). PhD study and the use of a reflective diary: A dialogue wit self. *Reflective Practice, 3*(2), 153-165. doi: 10.1080/14623940220142307.

Glick, L.A. (2007). The Bioterrorism Act after 5 years – Is it working? Retrieved from http://www.porterwright.com/files/Publication/a647e039-f9a0-4bcf-b08a-07ee62a98331/Presentation/PublicationAttachment/2b166993-4a4e-4576-b4dd-698bd3c06f44/647_FDLIarticle2-bioterrorism%20update.pdf

Goodman, R., Speers, M., McLeroy, K., Fawcett, S., Kegler, M., & Parker, E. (1998). Identifying and defining the dimensions of community capacity to provide a basis for measurement. *Health Education & Behavior, 25,* 258–278. doi: 10.1177/109019819802500303

Green, E. J., & Knechtges, P. L. (2015). Food safety knowledge and practices of young adults. *Journal of Environmental Health*, *77*(10), 18-24

Gyles, C. (2010). Agroterrorism. *The Canadian Veterinary Journal*, *51*(4), 347–348.

Hammersley, M. & Atkinson, P. (1995). *Ethnography: Principles in practice* (2nd ed.). New York, NY: Routledge.

Harbeck, K. M. (2009). Social disorganization theory. Research Starters Sociology (Online Edition).

Hausman, A. J., Hanlon, A., & Seals, B. (2007). Social capital as a mediating factor in emergency preparedness and concerns about terrorism. *Journal of Community Psychology*, *35*(8), 1073-1083. doi: 10.1002/jcop.20203

Hanifan, L.J. (1916). The rural school community center. *Annals of the American Academy of Political and Social Science, 67*, 130-138. doi: 10.1177/000271621606700118

Hawkins, R. L., & Maurer, K. (2010). Bonding, bridging and linking: How social capital operated in New Orleans following Hurricane Katrina. *British Journal of Social Work, 40*(6), 1777-1793. doi:10.1093/bjsw/bcp087

Hinrichs, C. C. (2013). Regionalizing food security? Imperatives, intersections and contestations in a post-9/11 world. *Journal of Rural Studies*, *297*. doi:10.1016/j.jrurstud.2012.09.003

Hirsch, J. (2013). Food (in)security: Are farms the next terrorist target? Retrieved from http://modernfarmer.com/2013/12/food-insecurity-farms-next-terrorist-target/.

Hoffman, B. (2006). *Inside terrorism* (2nd ed.). New York, NY: Columbia University Press.

Holdeman, E. (2011). Black swan events. *Emergency Management, 6*(3), 10.

Homeland Security Act of 2002, Public Law No. 107-296, H.R. 5005, 107th Cong. (2002).

Huanping, H., Huifen, W., Guoliang, L., & Ding'an, L. (2015). Study on food security guarantee from food manufacturers based on scientific outlook on development. *Carpathian Journal of Food Science & Technology*, *7*(1), 32-36.

Hubbard, G., Backett-Milburn, K., & Kemmer, D. (2001). Working with emotion: Issues for the researcher in fieldwork and teamwork. *International Journal of Social Research Methodology, 4*(2), 119-137. doi: 10.1080/13645570116992.

Hyvärinen, J., & Vos, M. (2015). Developing a conceptual framework for investigating communication supporting community resilience. *Societies, 5*(3), 583-597. doi:http://dx.doi.org/10.3390/soc5030583

Institute of Medicine and National Research Council. (2015). *A framework for assessing effects of the food system*. Washington, DC: The National Academies Press.

International Organization for Migration. (2014). Human mobility: Shaping vulnerability and resilience to disasters. Retrieved from https://www.iom.int/files/live/sites/iom/files/What-We-Do/docs/background-paper-for-HFA2-light.pdf

Jackson, B.A., Dixon, L., & Greenfield, V.A. (2007). Economically targeted terrorism. Retrieved from http://www.rand.org/content/dam/rand/pubs/technical_reports/2007/RAND_TR476.pdf

Johnson, Y., Herrmann, J., Wallace, R., Troutt, H., & Myint, M. (2009). Development and implementation of a functional exercise to assess public health agency response to foodborne bioterrorism. *Journal of Homeland Security and Emergency Management, 6*(1).

Kawachi, I., Kennedy, B. P., & Wilkinson, R. G. (1999). Crime: social disorganization and relative deprivation. *Social Science & Medicine*, *48*(6), 719-731. doi: 10.1016/S0277-9536(98)00400-6

Kemmelmeier, M., Broadus, A. D., & Padilla, J. B. (2008). Inter-group aggression in New Orleans in the immediate aftermath of Hurricane Katrina. *Analyses of Social Issues & Public Policy, 8*(1), 211-245. doi:10.1111/j.1530-2415.2008.00166.x

Keremidis, H., Appel, B., Menrath, A., Tomuzia, K., Normark, M., Roffey, R., & Knutsson, R. (2013). Historical perspective on agroterrorism: Lessons learned from 1945 to 2012. *Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science, 11*(S1), S17-S24. doi:10.1089/bsp.2012.0080

Klein, R., Nicholls, R., & Thomalla, F. (2003). Resilience to natural hazards: How useful is this concept? *Environmental Hazards, 5*, 35–45. Retrieved from http://dx.doi.org/10.1016/j.hazards.2004.02.001

Klitz, L. & Ramsay, J. D. (2012). Perceptual framing of homeland security. *Homeland Security Affairs*, *8*(15), 1-26. Retrieved from https://www.hsaj.org/articles/230

Knowles, T., Lane, J., Baynes, G., Speer, N., Jaax, J., Carter, D., & Bannister, A. (2005). *Defining law enforcement's role in protecting American agriculture from agroterrorism* (NIJ 212280). U.S. Department of Justice. Retrieved from https://www.ncjrs.gov/pdffiles1/nij/grants/212280.pdf

Kulig, J. C., Edge, D. S., Townshend, I., Lightfoot, N., & Reimer, W. (2013). Community resiliency: Emerging theoretical insights. *Journal of Community Psychology*, *41*(6), 758-775. doi:10.1002/jcop.21569

Kulig, J., Reimer, W., Townshend, I., Edge, D., & Lightfoot, N. (2011). Understanding links between wildfires and community resiliency: Lessons learned for disaster preparation and mitigation. Retrieved from http://www. ruralwildfire. ca/files/Final, 201325

Laycock, K., Mahone, J.P., & Filson, G. (2014). The impact of natural disaster on community engagement and connection in Goderich, Ontario. *Canadian Journal of Urban Research, 23*(1), 39-54.

Lee, J.V. (2010). Policing after 9/11: Community policing in an age of homeland security. *Police Quarterly, 13*(4), 347-366. doi: 10.1177/1098611110384083

Leung, C. W., Epel, E. S., Willett, W. C., Rimm, E. B., & Laraia, B. A. (2015). Household food insecurity is positively associated with depression among low-income supplemental nutrition assistance program participants and income-eligible nonparticipants. *Journal of Nutrition*, *145*(3), 622-627. doi:10.3945/jn.114.199414

Levy, B. S., & Sidel, V. W. (Eds.). (2012). *Terrorism and public health: A balanced approach to strengthening systems and protecting people.* (2nd ed.). New York, NY: Oxford University Press.

Leykin, D., Lahad, M., Cohen, R., Goldberg, A., & Aharonson-Daniel, L. (2016). The dynamics of community resilience between routine and emergency situations. *International Journal Of Disaster Risk Reduction*, *15*125-131. doi:10.1016/j.ijdrr.2016.01.008

Lin, N. (1999). Building a network theory of social capital. *Connections, 22*(1), 28-51.

Linnell, M. (2014). Citizen response in crisis: Individual and collective efforts to enhance community resilience. *Human Technology*, *10*(2), 68-94. doi:10.17011/ht/urn.201411203311

Lui, M. (2014). Frozen foods in pesticide recall sicken 900 in Japan, NHK says. *Bloomberg News*. Retrieved from http://www.bloomberg.com/news/articles/2014-01-08/frozen-foods-in-pesticide-recall-sicken-900-in-japan-nhk-says

Mahan, S. & Griset, P. L. (2008). *Terrorism in perspective.* (2nd ed.)*.* Thousand Oaks, CA: Sage Publications, Inc.

Maroto, M. E., Snelling, A., & Linck, H. (2015). Food insecurity among community college students: Prevalence and association with grade point average. *Community College Journal of Research & Practice*, *39*(6), 515-526. doi:10.1080/10668926.2013.850758

Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research* (5th ed.). Thousand Oaks, CA: Sage Publications.

Martine, G., Schensul, D., & Guzmán, J. M. (2013). *The demography of adaptation to climate change*. New York, NY: United Nations Population Fund, International Institute for Environment and Development, and El Colegio de México.

Maxwell, J. A. (2013). *Qualitative research design: An interactive approach* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

McCrea, R., Walton, A., & Leonard, R. (2014). A conceptual framework for investigating community wellbeing and resilience. *Rural Society*, *23*(3), 270-282. doi:10.5172/rsj.2014.23.3.270

McGinley, S. (2002). *Preventing agroterrorism*. Arizona Veterinary Diagnostic

Laboratory, Agricultural Experiment Station Research Report. Retrieved from

http://cals.arizona.edu/pubs/general/resrpt2002/3.pdf

Meesters, K., Olthof, L., & Van de Walle, B. (2014). Disaster in my backyard: A serious

game to improve community disaster resilience. *Proceedings of the European

Conference on Games Based Learning*, *2,*714-722. Retrieved from

http://ww.w.iscram.org/legacy/ISCRAM2013/files/276.pdf

Merton, R. K. (1968). *Social theory and social structure: Enl. Ed*. Free Press.

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A

Methods sourcebook* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Moats, J. B., (2007). *Agroterrorism: A guide for first responders*. (1st ed.)*.* Texas A&M

University Press.

Monke, J. (2007, March). Agroterrorism: Threats and preparedness. (Congressional

Research Service Report No. RL32521). Retrieved from Federation of American

Scientists website http://www.fas.org/sgp/crs/terror/RL32521.pdf

Murphy, E., & Dingwall, R. (2001). The Ethics of Ethnography. In P. Atkinson, A.

Coffey, S. Delamont, J. Lofland, & L. Lofland (Eds.), *Handbook of ethnography.*

(pp. 339-352). London, England: Sage Publications Ltd. Retrieved from

http://dx.doi.org.ezp.waldenulibrary.org/10.4135/9781848608337.n23

Nicholls, K., & Picou, J. S. (2013). The impact of Hurricane Katrina on trust in

government. *Social Science Quarterly, (2)*, 344. doi:10.1111/j.1540-

6237.2012.00932.x

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L.

   (2008). Community resilience as a metaphor, theory, set of capacities, and

   strategy for disaster readiness. *American Journal of Community Psychology,*

   41(1-2), 127-150. doi:10.1007/s10464-007-9156-6

Office of Homeland Security. (2002). National strategy for homeland security. Retrieved

   from http://www.dhs.gov/sites/default/files/publications/nat-strat-hls-2002.pdf

Office of the Press Secretary. (2004). Homeland Security Presidential Directive/HSPD-9.

   Retrieved from

   http://www.aphis.usda.gov/animal_health/emergency_management/downloads/hs

   pd-9.pdf

Oladosu, G.A., Rose, B., & Lee, B. (2013). Economic impacts of potential foot and

   mouth disease agroterrorism in the USA: A general equilibrium analysis. *Journal*

   of Bioterrorism & Biodefense, S12, 1-9. doi: 10.4172/2157-2526.S12-001

Olson, D. (2012). Agroterrorism: Threats to America's economy and food supply. *FBI*

   Law Enforcement Bulletin, *81*(2), 1-9. Retrieved from

   https://leb.fbi.gov/2012/february/agroterrorism-threats-to-americas-economy-and-

   food-supply

Pampel, F.C. (2006). *Threats to food safety.* New York, NY: Facts on File, Inc.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand

   Oaks, CA: Sage Publications, Inc.

Perez-Sales, P., Cervellon, P., Vazquez, C., Vidales, D., & Gaborit, M. (2005). Post-

   traumatic factors and resilience: The role of shelter management and survivours'

attitudes after the earth- quakes in El Salvador (2001). *Journal of Community and Applied Social Psychology, 15*, 368–382. doi: 10.1002/casp.827

Plodinec, M. J., Edwards, W. C., & White, R. K. (2014). Applications of a "Whole Community" Framework for Enhancing Community or Campus Resilience. *Procedia Economics And Finance*, *18*, 9-16. doi:10.1016/S2212-5671(14)00907-1

Post-Katrina Emergency Management Reform Act of 2006, S.3721, 109th Cong. (2006).

Public Health Security and Bioterrorism Preparedness and Response Act of 2002, Public Law No. 107-188, H.R. 3448, 107th Cong. (2002).

Putnam, R. (1995). Bowling Alone: America's declining social capital, *Journal of Democracy*, *6*, 65–78. doi: 10.1353/jod.1995.0002

Putnam, R. (2000). *Bowling alone: The collapse and revival of American community.* New York, NY: Simon & Schuster.

Reininger, B. M., Rahbar, M. H., Lee, M., Chen, Z., Alam, S. R., Pope, J., & Adams, B. (2013). Social capital and disaster preparedness among low income Mexican Americans in a disaster prone area. *Social Science & Medicine*, 8350-8360. doi:10.1016/j.socscimed.2013.01.037

Rohn, E. &.Erez, G. (2013). A framework for agro-terrorism intentions detection using overt data source. *Technological Forecasting & Social Change, 80*(9), 1877-1884. Retrieved from http://dx.doi.org/10.1016/j.techfore.2013.06.008

Rostila, M. (2011). The facets of social capital. *Journal for the Theory of Social Behaviour, 41*(3), 308-326. doi:10.1111/j.1468-5914.2010.00454.x

Rothstein, B. (2013). Corruption and social trust: Why the fish rots from the head down. *Social Research: An International Quarterly*, *80*(4), 1009-1032.

Rudestam, K.E. & Newton, R.R. (2007). *Surviving your dissertation: A comprehensive guide to content and process*. (3rd ed.). Thousand Oaks, CA: Sage Publications.

Sampson, R.J., & Groves, W.B. (1989). Community structure and crime: Testing social-disorganization theory. *American Journal of Sociology 94*, 774-802. doi:10.1086/229068

Sampson, R.J., Raudenbush, S.W., & Earls, F. (1997). Neighborhoods and violent crime: A multi-level study of collective efficacy. *Science 277*, 918-924. doi: 10.1126/science.277.5328.918

Scheider, R.G., Schneider, K.R., Webb, C.D., Hubbard, M., & Archer, D.L. (2009). Agroterrorism in the U.S.: An overview. Retrieved from http://edis.ifas.ufl.edu

Seebeck, L. (2007). Responding to systemic crisis: The case of agroterrorism. *Studies In Conflict & Terrorism*, *30*(8), 691-721. doi:10.1080/10576100701200165

Shannon, C. (2015). Understanding community-level disaster and emergency response preparedness. *Disaster Medicine and Public Health Preparedness*, 1-6. doi: 10.1017/dmp.2015.28

Shaw, C.R., & McKay, H.D. (1972). *Juvenile delinquency and urban areas*. Chicago, IL: University of Chicago Press.

Smith, K., & Lawrence, G. (2014). Flooding and food security: A case study of community resilience in Rockhampton. *Rural Society*, *23*(3), 216-228. doi:10.5172/rsj.2014.23.3.216

Srole. L. (1956). Social integration and certain corollaries: an exploratory study. *American Sociology Review, 21*(6), 709-716. Retrieved from http://www.jstor.org/stable/2088422

Stake, R.E. (2005). Qualitative case studies. In N.K. Denzin & Y.S. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.

Taleb, N. N. (2007). The black swan: The impact of the highly improbable. New York, NY: Random House.

Taracena, M. I. (2014). AZ Week: Yuma unemployment rate high, some say not accurate. Retrieved from https://www.azpm.org/p/featured-news/2014/3/21/31328-az-week-yuma-unemployment-rate-high-some-say-not-accurate/

Taylor, M. (2015). The future is now for the Food Safety Modernization Act. Retrieved from http://www.foodsafetynews.com/2015/03/the-future-is-now-for-the-food-safety-modernization-act/#.VcZ4JXiJndk

Teasdale, B., Stephens, P. C., Sloboda, Z., Stephens, R. C., & Grey, S. F. (2013). The effect of Hurricane Katrina on adolescent feelings of social isolation. *Social Science Quarterly, 94*(2), 490. doi: 10.1111/ssqu.12004

Trochim, W. & Donnelley, J. P. (2006). *The research methods knowledge base* (3rd ed.). Cincinnati, OH: Atomic Dog.

United Nations Development Program. (2009). Human development report 2009: Overcoming barriers, human mobility and development. Retrieved from

http://www.unngls.org/index.php/un-ngls_news_archives/2009/1911-undp-

human-development-report-2009

United Nations University. (2013). Food shortage. Retrieved from

http://archive.unu.edu/unupress/unupbooks/uu22we/uu22we09.htm

University of Maryland Medical Center. (2015). Food safety. Retrieved from

http://umm.edu/health/medical/ency/articles/food-safety

Unpublished manuscript. Walden University. *Emergency management collaboration,*

coordination, and communication between Fort Huachuca, the City of Sierra

Vista, & State organizations. Harris, L. (2014).

U.S. Army Yuma Proving Ground. (2014). History. Retrieved from

http://www.yuma.army.mil/History.aspx

U.S. Census Bureau. (2015). Yuma (city), Arizona. Retrieved from

http://quickfacts.census.gov/qfd/states/04/0485540.html

U.S. Customs and Border Protection. (2014). Yuma sector Arizona. Retrieved from

http://www.cbp.gov/border-security/along-us-borders/border-patrol-sectors/yuma-

sector-arizona

U.S. Department of Agriculture. (2011). Food emergency response network. Retrieved

from http://www.usda.gov/oig/webdocs/24601-6-AT.pdf

U. S. Department of Agriculture. (2015). Preparation and prevention. Retrieved from

http://www.fsis.usda.gov/wps/portal/fsis/topics/regulatory-compliance/food-

defense-planning

U.S. Department of Agriculture Economic Research Service. (2016). Ag and food sectors
and the economy. Retrieved from http://www.ers.usda.gov/data-products/ag-and-
food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy.aspx

U.S. Department of Defense Military Installations. (2015). Yuma Proving Ground,
Arizona. Retrieved from
http://www.militaryinstallations.dod.mil/MOS/f?p=MI:CONTENT:0::::P4_INST
_ID,P4_CONTENT_TITLE,P4_CONTENT_EKMT_ID,P4_CONTENT_DIREC
TORY,P4_TAB:310,Installation%20Overview,30.90.30.30.30.0.0.0.0,,

U.S. Department of Health and Human Services. (2012). Community resilience fact
sheet. Retrieved from
http://www.phe.gov/Preparedness/planning/abc/Documents/community-
resilience.pdf

U.S. Department of Homeland Security. (2010a). Bottom-up review report. Retrieved
from http://www.dhs.gov/xlibrary/assets/bur_bottom_up_review.pdf

U.S. Department of Homeland Security. (2008). Department of Homeland Security
bioterrorism risk assessment: A call for change. Retrieved from
http://www.nap.edu/catalog/12206.html

U.S. Department of Homeland Security. (2003a). Homeland Security Presidential
Directive 5. Retrieved from http://www.dhs.gov/publication/homeland-security-
presidential-directive- 5

U.S. Department of Homeland Security. (2003b). Homeland Security Presidential
Directive 8. Retrieved from http://www.gpo.gov/fdsys/pkg/PPP-2003-

book2/pdf/PPP-2003-book2-doc-pg1745.pdf

U.S. Department of Homeland Security. (2004). Homeland Security Presidential

Directive 9. Retrieved from http://www.gpo.gov/fdsys/pkg/PPP-2004-

book1/pdf/PPP-2004-book1-doc-pg173.pdf

U.S. Department of Homeland Security. (2011a). National preparedness goal (1st ed.).

http://www.fema.gov/media-library-data/20130726-1828-25045-

9470/national_preparedness_goal_2011.pdf

U.S. Department of Homeland Security. (2007). National preparedness guidelines.

Retrieved from

http://www.fema.gov/pdf/emergency/nrf/National_Preparedness_Guidelines.pdf

U.S. Department of Homeland Security. (2013). National Response Framework (2nd ed.).

Retrieved from http://www.fema.gov/national-response-framework

U.S. Department of Homeland Security. (2011b). Presidential Policy Directive/PPD-8:

National preparedness. Retrieved from http://www.dhs.gov/presidential-policy-

directive-8-national-preparedness

U.S. Department of Homeland Security. (2010b). Quadrennial homeland security report

review: A strategic framework for a secure homeland. Retrieved from

http://www.dhs.gov/xlibrary/assets/qhsr_report.pdf

U.S. Department of Homeland Security. (2014). The 2014 quadrennial homeland security

review. Retrieved from

http://www.dhs.gov/sites/default/files/publications/qhsr/2014-QHSR.pdf

U.S. Department of Homeland Security. (2014b). Sector risk snapshots: Food and

    agriculture sector. Retrieved from https://www.hsdl.org/?view&did=754033

U. S. Department of Interior. (2014). What is ESF #11. Retrieved from

    http://www.doi.gov/protectnch/programs/index.cfm

U.S. Environmental Protection Agency. (2016). Local Emergency Planning Committees.

    Retrieved from https://www.epa.gov/epcra/local-emergency-planning-committees

U.S. Food and Drug Administration. (2011). Food Safety Modernization Act facts.

    Retrieved from

    http://www.fda.gov/downloads/Food/GuidanceRegulation/UCM263777.pdf

U.S. Government Accounting Office. (2005). Homeland security: Much is being done to

    protect agriculture from a terrorist attack, but challenges remain. Retrieved from

    http://www.gao.gov/products/GAO-05-214

U.S. Government Accounting Office. (2011a). Homeland security: Challenges for the

    food and agriculture sector in responding to potential terrorist attacks and natural

    disasters. Retrieved from http://www.gao.gov/assets/130/126937.pdf

U.S. Government Accounting Office. (2011b). Homeland security: Actions needed to

    improve response to potential terrorist attacks and natural disasters affecting food

    and agriculture. Retrieved from http://www.gao.gov/assets/330/322674.pdf

U.S. Government Accounting Office. (2015). Biosurveillance: Additional planning,

    oversight, and coordination needed to enhance national capability. Retrieved from

    http://www.gao.gov/products/GAO-15-664T

U.S. Government Accounting Office. (2016a). Federal Emergency Management Agency: Progress and continuing challenges in national preparedness efforts. Retrieved from http://www.gao.gov/products/GAO-16-560T

U.S. Government Accounting Office. (2016b). The nation faces multiple challenges in building and maintaining biodefense and biosurveillance. Retrieved from http://www.gao.gov/products/GAO-16-547T

Wisner, B. (2003). Disaster risk reduction in megacities: Making the most of human and social capital. In A. Kreimer, M. Arnold, & A. Carlin (Eds.), *Building safer cities: The future of disaster risk* (pp. 181-196). Washington, DC: World Bank.

World Health Organization (WHO). (2014). Food security. Retrieved from http://www.who.int/trade/glossary/story028/en/

Yeh, J., Lee, J., Park, J., Cho, Y. S., & Cho, I. (2013). Countering the livestock-targeted bioterrorism threat and responding with an animal health safeguarding system. *Transboundary and Emerging Diseases*, *60*(4), 289-297. doi:10.1111/j.1865-1682.2012.01349.x

Yeh, J., Park, J., Cho, Y., & Cho, I. (2012). Animal biowarfare research: Historical perspective and potential future attacks. *Zoonoses and Public Health*, *59*(8), 536-544. doi: 10.1111/j.1863-2378.2012.01505.x

Young, Y. (2014). Social context and social capital. *International Journal of Sociology*, *44*(2), 37-62. doi:10.2753/IJS0020-7659440202

Yuma County. (2014). About the county. Retrieved from http://www.yumacountyaz.gov/visitors/about-the-county.

Yuma Visitors Bureau. (2014) Agritourism: Showing what we're growing in Yuma.

    Retrieved from http://www.visityuma.com/agritourism.html.

Zembroski, D. (2011). Sociological theories of crime and delinquency. *Journal of Human*

    Behavior in the Social Environment, *21*(3), 240-254. doi:

    10.1080/10911359.2011.564553

Appendix A: Interview Questions for Residents

Perception of Fear

Question 1: What do you perceive as the greatest threat to you and your family after an agro-terrorist attack that threatens the food security?

Follow-up Question: How would you protect yourself and your family from this threat?

Perception of Trust in Government Assistance/Agencies

Question 2: In the event of an agro-terrorist attack that causes a food shortage what is your local government's emergency management plan?

Follow-up Question: If you do not know, how would you find out following an agro-terrorist attack?

Question 3: Which local and state agencies do you believe are responsible for food security during a disaster in your area?

Follow-up Question: What do you think they are supposed to do?

Follow-up Question: If you do not know, how would you find out following an agro-terrorist attack?

Question 4: To what extent do you trust your local and state law enforcement to aid you and your immediate family following an agro-terrorist attack? Why or why not?

Perceptions of Social Capital

Question 5: To what degree do you believe your neighbors are friendly?

Question 6: How often do you visit or get together with your neighbors to chat or for social visits?

Question 7: How often do you and your neighbors do favors for each other such as watching each other's children, lending tools, or helping with daily requirements/chores?

Question 8: To what degree do you believe there is a feeling of belonging in your community?

Question 9: To what degree do you trust your neighbors in the event of an agro-terrorist attack and a food shortage?

Question 10: How would you protect yourself and your immediate family following an agro-terrorist attack and the threat of a food shortage?

Perceptions of Community Resilience

Question 11: How does the physical environment contribute to your overall health?

Question 12: Who do you identify as the leaders within your community?

Question 13: How well do you believe the leaders in your community listen to the residents?

Question 14: How frequently do you participate in community events?

Question 15: Do you think your community would be able to endure a large-scale disaster like an agro-terrorist attack that threatened the food supply?

Appendix B: Interview Questions for Experts

Question 1: How is your organization involved in the following: food security,

emergency management, and community services?

Follow-up Question: How frequently is your organization involved?

Question 2: In the event of an agro-terrorist attack that threatens food security what are

the responsibilities of your organization?

Question 3: What are your organization's responsibility to the citizens of Yuma, Arizona

following an agro-terrorist attack and a threat to food security?

Question 4: How does your organization work with community and the citizens of

Yuma, Arizona (e.g., meet and greets and educational classes on community topics of

interests)?

Follow-up Question: Please provide specifics on your organization's work with

the community.

Follow-up Question: How frequently does your organization work with the

community?

Question 5: To your knowledge, what kind of social networks are available for the

citizens of Yuma that could assist in their preparedness and/or response to a disaster such

as an agro-terrorist attack?

Question 6: In your opinion, do you think the citizens of the community function as a

community?

Follow-up Question: Do you think they would pull together and support and

protect one another if a threat to food security exists?

Appendix C: NIH Certification

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **LAMESHA CRAFT** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 10/23/2015

Certification Number: 1901297

Request to use graphic in dissertation

3 messages

<XXX@waldenu.edu> To: XXX@gmail.com

Fri, Mar 4, 2016 at 5:27 AM

Ms. Reading-Ikkanda,

Hello, I hope this email finds you doing well. Below is the feedback from Scientific American and my initial request to use your graphic from the 2007 Mark Fischten article title "Is Your Food Contaminated?" Further details can be found below in my request to Scientific American but I am requesting your permission to use the graphic in my dissertation.
I hope to hear from you soon.

V/R LaMesha Craft

From: <XXX@sciam.com> **Date:** March 3, 2016 at 4:48:11 PM EST **To:** "XXX@waldenu.edu" <XXX@waldenu.edu>

Subject: Re: REPUBLICATION REQUEST - TEXT

Dear Lamesha Craft

Unfortunately, we do not own the rights to the content you requested and are unable to grant permission for its re-use. Please contact the artist listed in the credit line directly regarding permission. Credit: LUCY READING-IKKANDA

Sincerely,

Rights & Permissions Scientific American One New York Plaza – Suite 4500 NY, NY 10004-1562

XXX@sciam.com

From: "XXX@waldenu.edu" <XXX@waldenu.edu> **Date:** Tuesday, December 29, 2015 6:23 PM **To:** <XXX@sciam.com>

Subject: REPUBLICATION REQUEST - TEXT

SCIENTIFIC AMERICAN

CONTACT INFORMATION - Name: LAMESHA CRAFT

Title: Ms.

Company/Institution: n/a

Email: XXX@waldenu.edu

MATERIAL REQUESTED - Title of Article: Is Your Food Contaminated

Author of Article: Mark Fischten

Date of Publication: September/2007

Page Numbers or Complete URL where **article** appears: http://www.nature.com/scientificamerican/journal/v297/n3/box/scientificamerican0907-112_BX1.html

ABOUT YOUR WORK - Tentative Title of Work: Dissertation: Perceived Threats to Food Security and Possible Responses Following an Agro-terrorist Attack

Author/Editor: LaMesha Craft

Edition Number or Issue Date: Not Applicable this is a PhD Dissertation

Brief Description of Work: The dissertation is for an academic requirement to meet the requirements for a PhD in Public Policy and

Administration.

Publisher's Name: Walden University

Publisher's Address: Walden University, 100 Washington Avenue South, Suite 900, Minneapolis, Minnesota 55401

Specify Language(s): English

Format:

- OTHER - Specify in Detail Graphic to be used in Dissertation

Purpose of Usage: In a dissertation to demonstrate the food processing waypoints.

Lucy Reading-Ikkanda <XXX@gmail.com> To: XXX@waldenu.edu

Fri, Mar 4, 2016 at 10:45 AM

Hi LaMesha, I hope all is well!

Thank you for requesting permission. Yes, you may use it. Please credit: Lucy Reading-Ikkanda for Scientific American Magazine.

Best! Lucy

[Quoted text hidden] -- **Lucy Reading-Ikkanda** Art Director | Designer | Illustrator LucyReading | ArtisteFeaste | dribbble | LinkedIn