Examining the Relationship between Community Resilience and Nonprofits in Mississippi

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Abstract

Nonprofits often act as vital pillars of support in disaster response and recovery efforts, providing essential services and resources to affected communities. There is a need to understand the intricate relationships between community resilience factors, the presence of nonprofits, and their potential impact in mitigating and responding to natural and man-made disasters. This research examined the interconnectedness of community resilience and nonprofits in Mississippi by seeking to identify relationships, gaps, strengths, and opportunities for enhancing the overall resilience of communities. This study utilized a mixed-methods design examining the research literature regarding the role nonprofits perform in community resiliency. It also conducted a correlational analysis examining the number of county nonprofits and those county's community resilience scores. This study sought to answer two research questions: (1) is there a statistically significant relationship between the number of nonprofits in a county and that county's community resiliency score; and (2) what key factors, actions, and structures are present in nonprofits that help communities become more resilient. The geographic areas for this study were all 82 counties in Mississippi. Data was analyzed computing the number of nonprofits in Mississippi counties and Community Resiliency Estimates (CRE) for those counties. Content and narrative analysis were used to analyzed the research literature. Study results found statistically significant relationships existing between the number of nonprofits in a county and that county's community resiliency scores at the state, urban, and rural geographic levels. One goal of this research was to shed light on the interplay between vulnerability, resilience, and the role of nonprofit organizations before, during, and after natural and man-made disasters. By further unraveling this interplay between nonprofit organizations and community resilience, findings from this study can help policymakers, community organizations, and local residents design and implement interventions to not only endure, but overcome and recover from natural and man-made disasters.

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Introduction

The global increase in the frequency of natural disasters, encompassing floods, landslides, extreme temperatures, wildfires, earthquakes, epidemics, insect infections, droughts, mass movements (dry), storms, and volcanic activities, has been well-documented (Tierney, 2007). However, tornado risk, in particular, significantly impacts property, human lives, and society, and research from the Storm Prediction Center (SPC) reveals that tornado-prone areas extend beyond the traditionally recognized "Tornado Alley" to include states like Illinois, Mississippi, Tennessee, Alabama, and Florida (Hwang, 2023). This expanded vulnerability highlights the importance of these states developing and implementing proactive mitigation plans to safeguard the public's well-being and protect property from the potential impact of tornadoes. Prominent catastrophic incidents, such as the Marmara Earthquake in 1999 in Turkey, the September 11, 2001, attacks in the U.S., the sequence of four hurricanes that battered Florida in 2004, the tsunami in Southeast Asia in 2004, Hurricane Katrina in 2005, the BP oil spill in 2010 in the U.S., and the Japan Earthquake in 2011, have indelibly imprinted distressing memories in people's minds, underscoring the vulnerabilities and weaknesses laid bare by such stressor events (Demiroz, 2012).

The recent surge of violent storms that swept across Mississippi, damaging cities such as Rolling Fork, Silver City, and Amory in 2023, received national attention from governmental and charitable organizations. Additionally, the escalation of impacts from natural and manmade disasters has been translucent globally over the past few decades. More recently, the state was prompted to disperse disaster response teams to provide essentials for residents affected by an EF4 tornado. On March 24th, 2023, a tornado struck, leaving a path of devastation with 16 fatalities and 165 injuries. Its destructive journey began in Issaquena County, tracking northeast through Sharkey and Humphreys Counties (Johnson, 2023). Rolling Fork, Midnight, and Silver City bore the brunt of the tornado. Rolling Fork experienced the most severe impact; numerous structures, including homes, businesses, hospitals, schools, and a water tower, were destroyed or severely damaged. Along its 59.4-mile (95.6 km) trajectory, the tornado inflicted varying degrees of damage, ranging from minor to catastrophic, affecting trees, buildings, and infrastructure. Eventually, the tornado dissipated, leaving behind a trail of devastation.

Ulmer (2014) reports that Mississippi ranks seventh in natural disaster likelihood, and its proximity to neighboring states increases the vulnerability. The state's climate and location contribute to frequent severe storms, including tornadoes and hurricanes along the Gulf Coast. According to the National Weather Service, Mississippi has had notable weather events since 2006 (Schumacher & Johnson, 2006). These adverse events include tornadoes in Yazoo, Hattiesburg, Louisville, Hurricane Isaac, and the historic flooding of the Mississippi River. While these events are not preventable, their predictability allows for preparation.

As highlighted by UNISDR (2015), natural disasters account for 90 percent of disaster-related deaths globally, with individuals and communities facing vulnerabilities being the primary victims. This accentuates the imperative for public managers, community organizations, and individual citizens to prioritize disaster mitigation and preparedness in their agendas consistently. The magnitude of devastation caused by disasters hinges on a community's exposure to hazards and its inherent physical and social vulnerabilities. Broadly defined, vulnerability to disasters encapsulates the "potential for loss" (Cutter, Boruff, & Shirley, 2003, p. 242). A poignant illustration of this is evident in the aftermath of Hurricane Katrina, where the adverse effects of social vulnerabilities within the community during

disasters became glaringly apparent. Comfort (2007) asserts that those who opted not to evacuate New Orleans during Katrina were predominantly individuals from low-income African American communities, primarily due to the lack of means for evacuation. Social factors such as diversity and communication gaps within a community further contribute to heightened vulnerability, and argue that diverse social environments face greater challenges in information diffusion and contend with knowledge gaps among individuals and communities (Comfort, 2007). In the face of numerous disasters, a substantial reduction in human and property losses could be realized through proactive preparedness and mitigation efforts by individuals, organizations, and the broader community.

Purpose of the Study

This study examined the potential correlation between resilience estimates and critical indicators related to health, economy, and social factors; and the relationship between the availability and utilization of charitable organizations in selected geographic regions of Mississippi. By conducting this analysis, the study's author aims to shed light on the interplay between vulnerability, resilience, and the role of charitable organizations in addressing community needs. This research examined the implications of disaster readiness and its impact on community resilience, particularly in the context of nonprofit organizations operating in Hinds, Rankin, and Madison counties within the Jackson Metro Area. By focusing on these counties, including urban centers and their surrounding regions, this research intends to shed insight on the unique challenges, opportunities, and dynamics of community resilience in this context. That information can then be used to guide stakeholders in building resilient communities and fostering sustainable development in the face of disasters.

Study's Significance

The significance of this study is multi-fold. Firstly, it sheds light on the intricate interplay between nonprofit organizations and community resilience, offering empirical validation to theoretical propositions. Secondly, it highlights the utility of existing literature as a lens to capture the nuanced dynamics of resilience functionality. Thirdly, this research employs quantifiable metrics to assess community status and its complex phenomena, serving as an informed basis for policy-making and program development in community advancement. This study's significance also rests in its desire to serve as a compass for formulating and implementing measures designed to increase the resiliency levels of different types of communities to endure and recover from various types of natural and man-made disasters. By further unraveling the interplay between nonprofit organizations and community resilience, this study offers actionable insights that can help policymakers, community organizations, and local residents design and implement interventions to overcome such disasters.

Nonprofits, Community Resiliency, and Community Resilience

Role of Non-Profit Organizations

The nonprofit sector plays a vital and multifaceted role in disaster readiness, contributing to various aspects of preparedness and enhancing community resilience (Phillips and Neal, 2008;

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Pfefferbaum and Flynn, 2012). Nonprofit organizations bridge the gap between the private and government sectors, fulfilling critical functions often driven by their charitable missions rather than strict fiscal considerations. These organizations serve as critical actors in disaster response and recovery, engaging in service delivery and coordination, fostering community engagement, disseminating vital information, mobilizing volunteers, establishing community partnerships, and advocating for policy changes (Phillips and Neal, 2008; Pfefferbaum and Flynn, 2012). Their unique characteristics and capabilities contribute to building community resilience and ensuring communities are better equipped to confront, recover from, and manage disasters.

Essential support services from nonprofits in a disaster usually include disaster preparedness education, emergency response, and long-term recovery support, bolstering the community's ability to withstand and recover from disasters (Dahlhamer, 2019; Sherrieb, 2020). This assistance strengthens the community's ability to withstand and recover from disasters. Additionally, nonprofits leverage their expertise in areas like social services, healthcare, housing, economic development, and environmental sustainability to address the unique needs of vulnerable populations during and after a disaster. Their established networks and community relationships enable them to deliver targeted support more efficiently. Furthermore, nonprofits advocate for policies and initiatives that promote resilience-building strategies and address systemic issues (Johnson, 2018; Smith, 2021). They even advocate for equitable resource allocation, improved infrastructure, and inclusive policies to foster a conducive environment for community resilience.

The relationship between community resilience and nonprofit organizations is symbiotic. Nonprofits depend on resilient communities to carry out their missions effectively, as resilient communities provide a supportive context for nonprofits to operate and serve. Conversely, nonprofits actively contribute to community resilience by addressing immediate and long-term needs, fostering collaboration, and advocating for policies that enhance community well-being (Phillips and Neal, 2008; Pfefferbaum and Flynn, 2012). Moreover, nonprofits are crucial in addressing community vulnerability by mitigating and alleviating factors that undermine community resilience. This proactive approach enhances the community's ability to respond effectively to disasters and strengthens the overall operations of nonprofits. By prioritizing vulnerability reduction and resilience-building initiatives, nonprofits create a more resilient environment that fosters sustainable community development (Cutter, 2008; Norris, 2008 Javernick and Scheyvens, 2017).

Community Resiliency

Community resilience is defined as the capacity of a community to resist disasters and to take alleviating actions that are consistent with achieving the expected level of protection, it is also the measure of the community's ability to utilize available resources to respond to, withstand, and recover from adverse situations (Jewett, 2021; Zhong, 2020; RAND, 2023). In context, communities that respond and recover from a hazardous event and return to normal quickly, with good preparation to reduce disaster losses rather than waiting for an event to occur, are recognized as having a high resilience level (Zhong, 2020). In contrast, if the community needs better preparation, it is recognized as having low resilience levels.

Determining community resilience involves assessing various factors such as social cohesion, economic stability, infrastructure quality, resource access, disaster preparedness, and health indicators (Community and Regional Resilience Institute (CARRI), 2012; Paton, Johnston, and Houghton, 2007). Measurement often includes surveys, interviews, observations, and quantitative metrics. While typically associated with disasters, scholars began recognizing that the complexity of these challenges necessitates involvement from public and private organizations in crafting systematic approaches to community resilience (Demiroz and Hu, 2014; Sledge and Thomas, 2019). By doing so, the importance of understanding how nonprofits contribute to building resilience in communities in different phases of the disaster management cycle is highlighted. Through this context, assessments of community resilience through natural disasters can help us determine the interplay of nonprofits from the perspective of the nonprofits' role before, during, and after such disasters (Chaves, Stephens, and Galaskiewicz, 2004; Patten, 2017).

It is crucial to prioritize the development of community resilience to disasters, especially in regions marked by high risk and limited capacity. Mississippi is a case in point, being among the states confronting significant natural hazard risks alongside prevalent poverty (Oxfam, 2009). A comprehensive report from Oxfam (2025) scrutinizes thirteen southeastern states, including Mississippi, highlighting that "approximately 80 percent of all US counties experiencing persistent poverty (defined as a county in which at least 20 percent of the population endures poverty for three decades or more) are concentrated in this region."

Identifying places that are resilient to disasters and understanding the key factors supporting resiliency is critical for pre-disaster preparation, disaster planning, mitigation, and post-disaster recovery. This research project will identify how nonprofits can help communities become more resilient before, during, and after disasters and other emergencies. The concept of resilience has been widely used in the research world and in the scientific field to describe the necessary processes that involve adaptation and adversity as they relate to the ability of a place to recover from hazards (Jewett, 2021). It has also been linked to social capital, collective action, robust governmental structure, and residents' perception of risk (Fothergill and Peek, 2004; Zhong, 2020). There is a need to understand the intricate relationships between community resilience factors and the effectiveness of nonprofits in mitigating and responding to adversities. This research examined the interconnectedness of community resilience and nonprofit efforts in Mississippi, seeking to identify relationships, gaps, strengths, and opportunities for enhancing the overall resilience of the communities.

Community Resilience Estimates (CRE)

Community resilience estimates refer to quantitative or qualitative assessments of a community's resilience level or capacity to withstand and recover from shocks, stresses, or disasters. These estimates aim to understand the community's ability to bounce back, adapt, and thrive in adversity.

The resilience estimates may encompass various dimensions and indicators that capture different aspects of resilience. To facilitate disaster preparedness, the Census Bureau has developed small area estimates, identifying communities where resources and information may effectively mitigate the impact of disasters (Van Westen, 2013). Individual (I) and household (HH) characteristics from the 2021 American Community Survey (ACS) were modeled, in combination with data from the Population Estimates Program, to create the estimates and then published for public use (United States Census Bureau, 2023). Resilience estimates can aid stakeholders and public health officials in modeling differential impacts

among varying geographic locations and groups who are less likely to have the capacity and resources to overcome the obstacles presented during a hazardous event (Community and Regional Resilience Institute, 2012; RAND, 2022).

Assessing Communities through Vulnerability

Community vulnerability and community resilience are interconnected but distinct concepts within disaster management and community development (Tierney, 2020; Cutter, 2008; Norris, 2008). Community vulnerability refers to the degree to which a community is at risk or susceptible to the adverse impacts of hazards or disasters. It encompasses various factors that increase a community's exposure to harm and reduce its ability to respond and recover effectively. These factors may include socioeconomic disparities, inadequate infrastructure, limited access to resources and services, environmental degradation, and social fragmentation (Tierney, 2020; Cutter, 2003; Fothergill and Peek, 2004). Understanding community vulnerability allows us to identify the weaknesses and challenges that a community faces in dealing with potential disasters.

As previously noted, community resilience refers to a community's capacity to anticipate, withstand, respond to, and recover from the impacts of hazards or disasters (Fothergill and Peek, 2004; Peters, 2020; Zhong, 2020). It highlights the community's ability to adapt, bounce back, and even thrive in adversity. Building community resilience involves strengthening the community's social, economic, and institutional systems to enhance its ability to absorb shocks, maintain functionality, and restore normalcy after a disaster (Jewett, 2021; Zhong, 2020; RAND, 2023). This includes aspects such as preparedness, response capabilities, social cohesion, economic diversification, effective governance, and the presence of supportive networks and resources.

Assessing community vulnerability and disaster readiness requires evaluating critical factors influencing a community's susceptibility and preparedness. Indicators of resiliency include the community's social dynamics, including demographic composition, social cohesion, marginalized populations, language barriers, and access to information (Comfort and Kapucu, 2006; Norris, 2008). It is crucial to identify and address the specific vulnerabilities of groups such as the elderly, children, people with disabilities, and low-income populations, as they may face heightened risks during disasters. Research has shown that socioeconomic status influences individuals' perception and response to disaster risks, shaping their approaches to preparedness based on their experiences with social inequalities (Crimmins, 2004).

Vulnerability to disasters is associated with various social factors, including low rates of charitable availability, low income, and limited resources, which can hinder the ability of susceptible communities to respond using local resources, leading to dependence on state and federal assistance (SAMHSA, 2017). Lower rates of charitable giving also impact both vulnerability and the social capacity to respond, as communities with fewer work-related organizations and civic organizations have less capability to respond without aid (Peters, 2020). Minority communities in the United States, particularly in states with pronounced disparities and limited access to resources, experience significant health disparities related to socioeconomic status, impacting their vulnerability to disasters (Crimmins, 2004). Moreover, low socioeconomic status in the United States and globally affects an individual's understanding of disaster risk, preparedness efforts, and response to warnings and evacuations. Different socioeconomic groups respond differently due to their experiences with systemic and environmental injustices (SAMHSA, 2017).

The following sections present a quantitative exploration of potential statistical relationships between nonprofits, community resilience scores, and geographic locations.

Methodology

Study Design and Research Questions

This study utilized a mixed-methods design that incorporated examining the research literature regarding the role of nonprofits perform in community resiliency, and conducting a correlational analysis of the number of county nonprofits and county community resilience scores. A supplemental analysis was also conducted to examine whether any correlations were present between the number of county nonprofits and CRE factors in the Jackson Metropolitan Statistical Area (MSA) and Rural Statistical Areas (RSA). Two primary research questions were developed to guide this study:

(1) Is there a statistically significant relationship between the number of nonprofits in a county and that county's community resiliency score; and

(2) What key factors, actions, and structures are present in nonprofits that help communities become more resilient.

The first research question investigates the statistical underpinning of the connection between the presence and types of nonprofit organizations within a specific county and the corresponding community resiliency index score. The goal of this question is to discern whether a quantifiable and statistically significant association exists between the quantity of nonprofit entities in a county and the overall level of community resilience observed. The second research question sought to explore the intricate fabric of factors, actions, and structural components within nonprofits that play a pivotal role in fostering enhanced community resilience. The Research Hypothesis for this study is as follows:

(Hy1) The higher the community resilience index score for a county, the higher the number of nonprofit agencies within that county.

Target Geographic Areas

The geographic areas used for this study were all 82 counties in Mississippi, and the geographic areas comprising the "Jackson Metropolitan Statistical Area", and the Rural Statistical Area (RSA). Particular focus was placed on nonprofits located in the "Jackson Metropolitan Statistical Area" comprised of Hinds, Rankin, and Madison counties. The following passages provide a description of both those statistical areas:

<u>Metropolitan Statistical Area</u> - Jackson MSA is "Jackson Metropolitan Statistical Area." It refers to a geographic region centered around the city of Jackson, which includes surrounding counties, and is used by the United States Census Bureau for statistical purposes. An MSA is an area with a significant economic and social connection to a central city. In the case of Jackson MSA, it encompasses the city of Jackson and the neighboring counties that are economically and socially linked to it. The specific counties included in the Jackson MSA may vary depending on the criteria and boundaries set by the Census Bureau (United States Census Bureau, n.d.).

Rural Statistical Area (RSA) - A rural statistical area (RSA) is a geographical region defined by the United States Census Bureau for the purpose of collecting and analyzing statistical data related to rural areas. RSAs are designed to capture and measure the characteristics, demographics, and economic activities specific to rural communities. Rural refers to areas and communities characterized by a low population density and typically located outside of urban or suburban regions. Rural areas are often associated with agriculture, farming, forestry, and natural landscapes (United States Census Bureau, n.d.).

Data Sources

Data sources for this study included utilizing Community Resilience Estimates (CRE) pulled from the US Census Bureau (United States Census Bureau, n.d.). The Tax-exempt Charitable Organization (i.e., nonprofits) data was pulled from the Internal Revenue Service (Ely et al., 2023). The Internal Revenue Service's Exempt Organizations Business Master File Extract provided information on nonprofit organizations included in this study. The data in this file was sorted in the order of COUNTY, FOUNDATION, SUBSECTION, CLASSIFICATION, and lastly, NAME. The listing of nonprofit organizations with 501C3 status from the Internal Revenue Service characterized as charitable organizations for 82 counties in MS numbered roughly 15,068 (N= 15,068). Data on the ten susceptibility indicators (Risk Factors) were taken from the United States Census Bureau (n.d.) and reports identifying risk factors (Smith, 2004; Tierney, 2020; Williams, 2020). Indicators were chosen based on presently known correlates of disease. The 2019 Community Resilience Estimates (CRE) were produced using information on individuals and households from the 2019 American Community Survey (ACS) and the Census Bureau's Population Estimates Program (PEP).

Risk Factors

This study's Community Resilience Estimates (CRE) were based on individual and household-level risk factors. Figure 1 provides a description and categorization of the data used to compute this study's correlation statistical findings. It presents a comprehensive overview of the key Risk Factors (RF) affecting both Households (HH) and Individuals (I) in the context of socioeconomic and demographic information derived from the US Census Bureau data. The figure aims to visually highlight the multifaceted aspects that influence the well-being and livelihoods of households and individuals nationwide.

These binary risk factors measure vulnerability and are combined or added up to assess the overall risk level for different populations. Utilizing data from the American Community Survey (ACS) conducted by the US Census Bureau, the figure aims to elucidate the pivotal role of essential variables in estimating and comprehending potential risks within a given demographic context. A predominant risk factor is defined as a factor or variable significantly influencing a particular outcome, event, or situation (Smith, 2019; Williams, 2020). It is the primary factor contributing to the occurrence or severity of the outcome in question.

Figure 2 provides a visual representation of the "Risk Factors" presented earlier. It displays them using thermal imaging for a given population in each MS county.

**Figure 1.** Risk Factors (RF) for Households (HH) and Individuals (I)

Risk Factors (RF) for Households (HH) and Individuals (I).

·RF 1: Income to Poverty Ratio (IPR) < 130 percent (HH).	·RF 5: No one in the household is employed full-time, year-round. The flag is not applied if all household residents are 65 or older (HH).	·RF 8: Being aged 65 years or older (I)
·RF 2: Single or zero caregiver household – only one or no individuals living in the household who are 18-64 (HH)	·RF 6: Disability posing constraint to significant life activity.	·RF 9: Households without a vehicle (HH)
·RF 3: Unit-level crowding is> 0.75 persons per room (HH).	·Persons who report having any one of the six disability types (I): hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty.	·RF 10: Households without broadband Internet access (HH)
·RF 4: Communication barrier defined as either o Limited English-speaking households1 (HH) or o No one in the household over the age of 16 with a high school diploma (HH)	RF 7: No health insurance coverage (I)	

(United State Census Bureau, 2022)

Legend: Risk Factors (RF) for Households (HH) and Individuals (I).

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- RF 6: Disability posing constraint to significant life activity.
- Persons who report having any one of the six disability types (I): hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty.
- RF 7: No health insurance coverage (I)
- RF 8: Being aged 65 years or older (I)
- RF 9: Households without a vehicle (HH)
- RF 10: Households without broadband Internet access

Figure 2. Predominant Risk Factor Map of MS, 2019
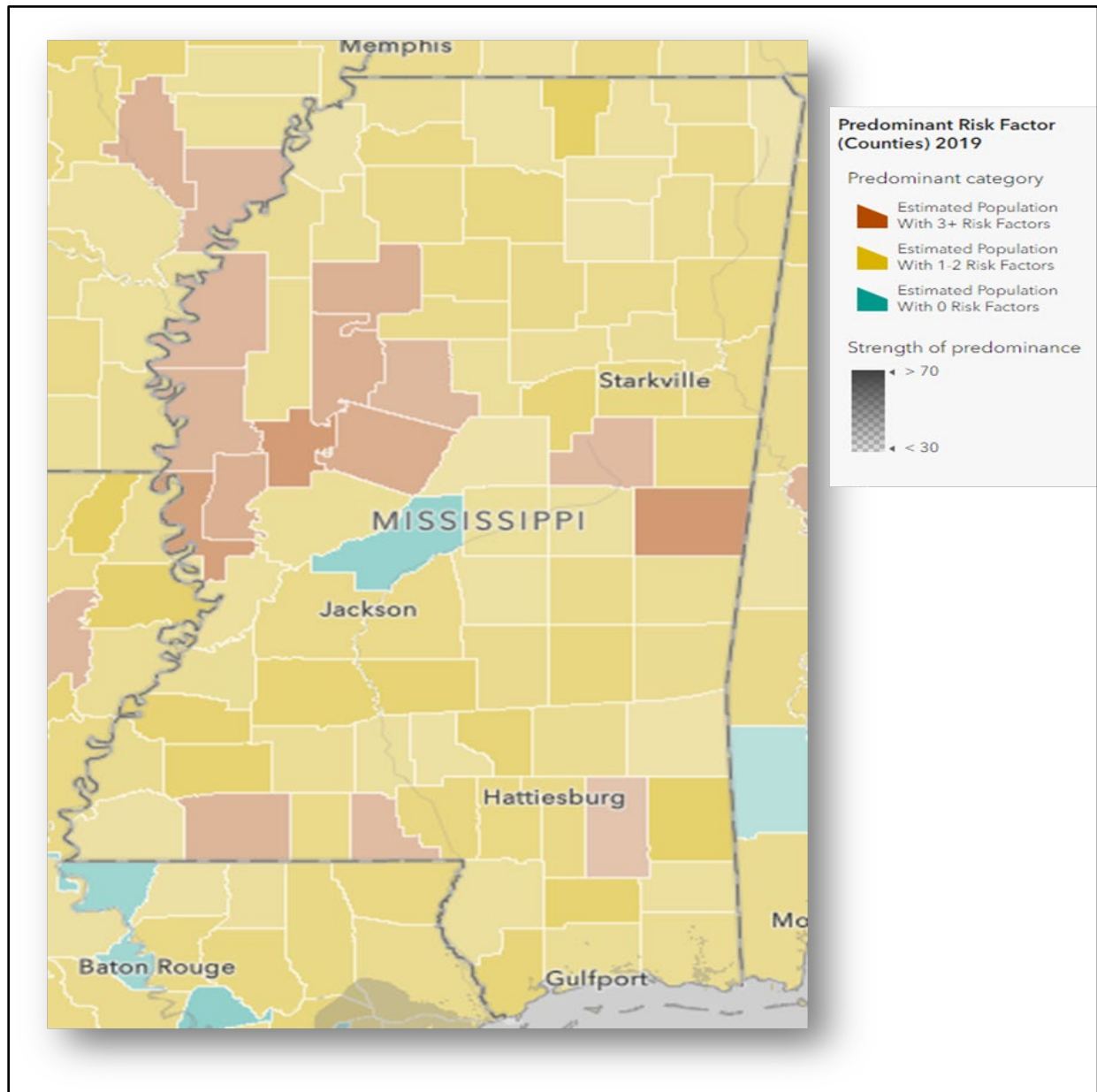
Source: United States Census Bureau, https://www.census.gov/data/experimental-data-products/cre-heat.html, Thermal Imaging, 2019, 2022)

Data Analysis

Data was analyzed computing the number of nonprofits in all 82 Mississippi counties and associated CRE risk factor indicators for those counties, and computing and descriptive statistics (e.g., frequency counts, percentages, mean scores). Content and narrative analysis were used to analyzed research literature reviewed. Statistical calculations were performed using the SPSS statistical analysis software.

Findings

The Pearson product-moment correlations were computed using parametric analysis. Table 1 illustrates the correlation values for each respective risk factor, accompanied by pertinent statistical significance information. Pearson product-moment correlations were calculated to assess the relationship between community resilience estimates and risk factors ranging from 0 to 3 or more. Additionally, the correlation analysis examined the presence of linearity between these variables and the statewide availability of nonprofit organizations. Results demonstrate that indicators of community resilience (i.e., Risk Factors - RF) and the number of county nonprofit organizations are closely related; that is, a statistically significant relationship exists between the number of nonprofits in a county and that county's community resiliency score.

Table 1 R values and Statistical Significance of Nonprofit Organizations per Geographical Areas

Geographical Area	Nonprofit Organizations (N)	Correlation Score_(0-1 RF)	Correlation Score_(1-2 RF)	Correlation Score_(3-4 RF)	Statistical Significance
Statewide	15068	0.677*	0.772*	0.826*	yes
Supplemental Analyses					
Jackson MSA/Rural RSA	5234	0.734	0.871*	0.959*	Yes (RF 1-2, 3-4)
Jackson MSA	5019	0.750	0.864	0.979	NA
Rural RSA	215	0.998	0.997	0.969	NA

* Statistically Significant at 0.05 level, two-tailed tests. NA indicates the statistical significance could not be computed due to limited case numbers

Table 2 lists each Mississippi county, the corresponding county population, a quantified measure of community resilience based on the number of risk factors associated, and the number of nonprofits operating within a county. This estimate is derived from a comprehensive assessment of economic stability, social cohesion, disaster preparedness, and access to essential services. The table compares risk factor estimates and the number of nonprofits present in each county.

Table 2. Listing of Community Resilience Estimates and Nonprofit Quantities for Mississippi

County	Population	RF 0 Estimates	RF1-2 Estimates	RF3-4 Estimates	Nonprofit Number
Adams County, Mississippi	28578	6465	12095	10018	205
Alcorn County, Mississippi	36483	11097	15269	10117	126
Amite County, Mississippi	12258	2766	4507	4985	55
Attala County, Mississippi	18149	4788	6827	6534	78
Benton County, Mississippi	8250	1909	4150	2191	20
Bolivar County, Mississippi	29586	6472	11214	11900	212
Calhoun County, Mississippi	14336	3551	6193	4592	62
Carroll County, Mississippi	9622	2833	2955	3834	23

County	Population	RF 0 Estimates	RF1-2 Estimates	RF3-4 Estimates	Nonprofit Number
Chickasaw County, Mississippi	16733	3696	7154	5883	64
Choctaw County, Mississippi	8184	2000	3832	2352	33
Claiborne County, Mississippi	7751	1686	3176	2889	55
Clarke County, Mississippi	15493	3949	6551	4993	60
Clay County, Mississippi	19173	4873	7822	6478	100
Coahoma County, Mississippi	21694	4475	9082	8137	132
Copiah County, Mississippi	27692	6770	13060	7862	64
Covington County, Mississippi	18633	4004	8772	5857	60
DeSoto County, Mississippi	184696	75007	75908	33781	605
Forrest County, Mississippi	72743	19807	31972	20964	512
Franklin County, Mississippi	7703	1547	3699	2457	33
George County, Mississippi	23982	6685	9610	7687	77
Greene County, Mississippi	11077	2372	5502	3203	20
Grenada County, Mississippi	20611	4689	8885	7037	94
Hancock County, Mississippi	47547	13659	22270	11618	155
Harrison County, Mississippi	207018	67965	85750	53303	781
Hinds County, Mississippi	225821	62159	98133	65529	3687
Holmes County, Mississippi	16306	3429	5936	6941	100
Humphreys County, Mississippi	8035	1389	2840	3806	37
Issaquena County, Mississippi	989	204	328	457	1
Itawamba County, Mississippi	22617	7399	9729	5489	56
Jackson County, Mississippi	143190	47236	59843	36111	512
Jasper County, Mississippi	16317	2726	7428	6163	48
Jefferson County, Mississippi	6690	1239	3201	2250	51
Jefferson Davis County, Mississippi	11104	3412	4356	3336	40
Jones County, Mississippi	67196	18044	28213	20939	220
Kemper County, Mississippi	8767	1729	2830	4208	52
Lafayette County, Mississippi	49852	16815	22256	10781	294
Lamar County, Mississippi	63213	20232	28317	14664	41
Lauderdale County, Mississippi	72321	20521	29935	21865	426
Lawrence County, Mississippi	12586	3776	5018	3792	40
Leake County, Mississippi	21247	5954	8572	6721	61
Lee County, Mississippi	85139	27131	35212	22796	375
Leflore County, Mississippi	27441	5555	10388	11498	161
Lincoln County, Mississippi	34039	8296	14054	11689	110
Lowndes County, Mississippi	57832	18321	25131	14380	296
Madison County, Mississippi	105275	43110	39712	22453	744
Marion County, Mississippi	24141	5802	10919	7420	79
Marshall County, Mississippi	33677	9232	13160	11285	151
Monroe County, Mississippi	35169	9771	15626	9772	140

County	Population	RF 0 Estimates	RF1-2 Estimates	RF3-4 Estimates	Nonprofit Number
Montgomery County, Mississippi	9775	2224	3949	3602	53
Neshoba County, Mississippi	29052	7533	11530	9989	101
Newton County, Mississippi	20667	5252	8912	6503	67
Noxubee County, Mississippi	10324	2076	4591	3657	58
Oktibbeha County, Mississippi	45661	13546	20466	11649	279
Panola County, Mississippi	34106	9663	14686	9757	134
Pearl River County, Mississippi	54452	15713	21821	16918	176
Perry County, Mississippi	11973	3203	4365	4405	27
Pike County, Mississippi	38736	9793	16973	11970	201
Pontotoc County, Mississippi	32122	10955	12151	9016	86
Prentiss County, Mississippi	24548	7312	10699	6537	89
Quitman County, Mississippi	6716	1257	2755	2704	66
Rankin County, Mississippi	150896	55214	65873	29809	588
Scott County, Mississippi	28062	8475	11046	8541	68
Sharkey County, Mississippi	4321	798	1712	1811	38
Simpson County, Mississippi	26452	7232	12553	6667	89
Smith County, Mississippi	15916	3747	6790	5379	62
Stone County, Mississippi	17222	4034	8344	4844	58
Sunflower County, Mississippi	21352	4599	8822	7931	123
Tallahatchie County, Mississippi	11444	2786	3882	4776	57
Tate County, Mississippi	27425	8417	12135	6873	112
Tippah County, Mississippi	21764	6916	8662	6186	78
Tishomingo County, Mississippi	19271	6224	7177	5870	76
Tunica County, Mississippi	9585	2586	3677	3322	37
Union County, Mississippi	28717	8757	11264	8696	92
Walthall County, Mississippi	14284	3106	5576	5602	36
Warren County, Mississippi	45269	11829	18192	15248	261
Washington County, Mississippi	43655	9523	16397	17735	251
Wayne County, Mississippi	20170	5749	7628	6793	50
Webster County, Mississippi	9675	2795	3952	2928	39
Wilkinson County, Mississippi	7614	1737	2950	2927	23
Winston County, Mississippi	17634	4028	6662	6944	83
Yalobusha County, Mississippi	12080	2778	5341	3961	61
Yazoo County, Mississippi	23006	5423	9415	8168	99

Statewide Correlations by Risk Factors

Specifically, for risk factors ranging from 0 to 1, a strong and statistically significant positive correlation was observed with a Pearson correlation coefficient of r = 0.677 (p < 0.01). This implies that as

the number of risk factors in this category increases, there is a proportionate rise in the community resilience index values. Similarly for risk factors spanning from 1 to 2, a significantly stronger positive correlation was observed with a Pearson correlation coefficient of r = 0.772 (p < 0.01). These findings highlight a pronounced relationship between the variables, as a higher count of risk factors in this range corresponds to increased community resilience values.

For areas with risk factors of 3 or more, the correlation exhibited even greater strength, with a Pearson correlation coefficient of r = 0.826 (p < 0.001). This substantial positive correlation indicated that regions with higher occurrences of risk factors in this range are associated with notably elevated community resilience index values.

Jackson Metropolitan Statistical Area / Rural Correlations

This analysis focused on the combined dataset of the Jackson Metro area (Hinds, Rankin, and Madison) along with resilience estimates for Sharkey, Humphreys, and Monroe County (Rural area), resulting in a total sample size of n=6. For risk factors spanning from 1 to 2 (1-2 RF), a strong and statistically significant positive correlation (Pearson correlation coefficient of r = 0.871 (p < 0.05) was observed. This finding indicated a positive relationship between nonprofit availability and community resilience estimates in the corresponding counties within this risk factor category.

Similarly for regions characterized by three or more risk factors (3 or more RF), the correlation coefficient was notably higher with r = 0.959 (p < 0.01). This significant and robust positive correlation suggests that nonprofit availability is strongly associated with community resilience estimates in the counties with three or more risk factors.

However, for risk factors categorized as 0 (0 RF), the correlation coefficient was r = 0.734, and the probability was not statistically significant. As a result, we reject the hypothesis that a relationship exists between nonprofit availability and community resilience estimates in the corresponding counties for this risk factor category.

Jackson MSA Correlations   (Hinds, Rankin, and Madison)

A significant and robust positive correlation for risk factors categorized as 0 (0 RF), as indicated by a Pearson correlation coefficient of r = 0.750 was observed. This finding suggests that the presence of nonprofits is associated with the level of community resilience estimates within this risk factor category.

For risk factors spanning from 1 to 2 (1-2 RF), a notably higher correlation coefficient of r = 0.864 was observed underscoring a stronger positive correlation between nonprofit availability and community resilience estimates. This suggests that a more significant portion of nonprofits is aligned with the community resilience levels in this risk factor category.

Notably, for regions characterized by three or more risk factors (3 or more RF), the correlation coefficient soared to r = 0.979. This close-to-perfect positive correlation highlights a compelling association, implying that a substantial proportion of nonprofit existence is congruent with community

resilience estimates within these areas. Despite the limited number of cases impacting the statistical significance of some correlations, the evident trend of strong positive relationships between nonprofit availability and community resilience estimates remains pronounced.

Rural Correlations (Sharkey, Humphreys, and Monroe)

A highly significant and almost perfect positive correlation for risk factors categorized as 0 (0 RF), Pearson correlation coefficient of $r = 0.998$, was observed. This finding suggests the presence of nonprofits correlates very strongly with the level of community resilience estimates within this risk factor category. For risk factors ranging from 1 to 2 (1-2 RF), an equally impressive correlation coefficient of $r = 0.997$ was observed, further exemplifying a robust positive correlation between nonprofit availability and community resilience estimates.

Notably, the correlation coefficient remained substantial for regions characterized by three or more risk factors (3 or more RF), with $r = 0.969$. While slightly lower than the previous categories, this finding still highlights a strong positive relationship between nonprofit existence and community resilience estimates within these areas.

Discussion

This study assessed the impact of nonprofit organizations on community resilience. Statistical results revealed that communities with a higher concentration of nonprofits tended to have higher resiliency scores. These higher scores in turn represent increased chances for a community to successfully face and recover from various types of natural and/or man-made disasters. These findings also highlight the dynamic and context-dependent relationship between nonprofit organizations and community resilience across different risk factor categories and geographical areas.

The statistically significant positive correlations for 1-2 RF and 3 or more RF categories underscore the critical role of nonprofit engagement in fostering community resilience in regions facing multiple risk factors. Rural nonprofits ($r > 0.96$) demonstrated a heightened relationship with community resilience scores due perhaps to them being service providers in areas with limited institutional infrastructure. These organizations often serve as central coordination points during emergencies, providing vital support in healthcare access, crisis response, and social services.

Urban environments presented a different relationship pattern ($r = 0.750$) as cities typically provide a base with more established governmental services, multiple healthcare facilities, and professional emergency response teams. The presence of these various support systems creates a broader foundation for community resilience, which perhaps explains the lower, though still significant, correlation between nonprofit presence and resilience measures in urban settings.

This study's findings support its hypothesis (H1) that a positive relationship exists between the community resilience score and the number of nonprofit agencies within a county. Counties with higher community resilience indices tend to have more nonprofit organizations. This reinforces the idea that an increased presence of nonprofits corresponds to higher community resiliency, suggesting the involvement

of nonprofit agencies plays a substantial role in contributing to community resilience. Notably, even in scenarios where the correlation value is high while the actual number of nonprofits remains low, it underscores the significance of nonprofit engagement in enhancing resiliency. This finding reflects the importance of all communities, especially communities with fewer nonprofits, to build upon and utilize the assets currently existing.

Asset-Based Approach to Improving Community Vulnerability

An asset-based approach to studying the availability of nonprofit organizations with community index scores is critical because it shifts the focus from solely identifying community problems and deficits, to also recognizing and harnessing a community's existing strengths and resources. This approach is precious when examining the role and impact of nonprofit organizations in a community's well-being and

Figure 3. An asset-based approach to understanding nonprofit's role in community resilience.
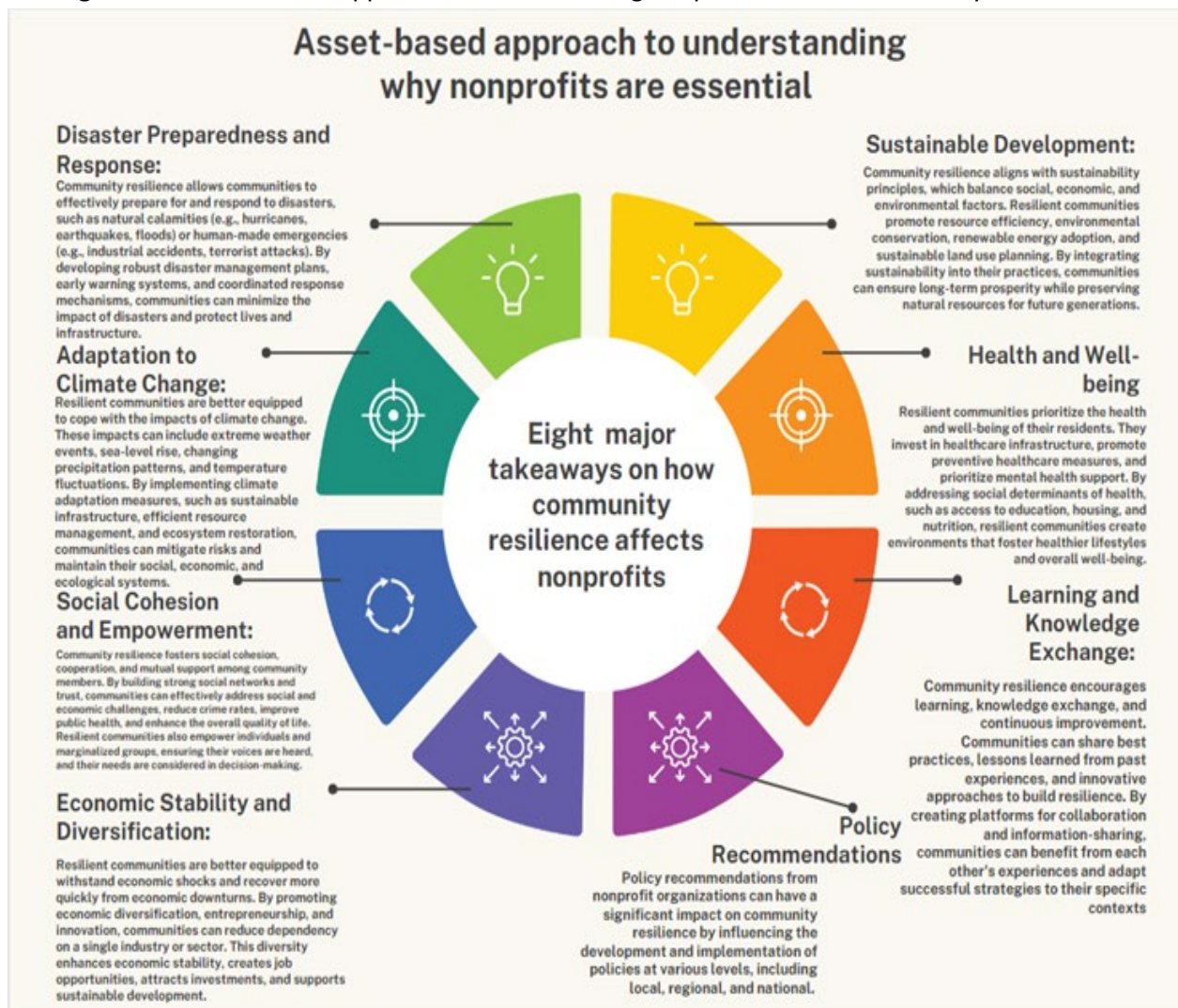
Source: García, (2020). Asset-based community development (ABCD): Core principles. In *Research handbook on community development* (pp. 67-75).

development. Figure 3 visually depicts why it is essential to consider the role of nonprofit organizations in impacting community resilience index scores. The graphic holistically illustrates the various components of an asset-based approach and illustrates how those components are connected and could help foster a community's well-being and societal advancement. The approach centers around recognizing and harnessing nonprofit organizations' diverse strengths, resources, and capacities. At the core of this approach is the depiction of a vibrant community ecosystem. A central hub that represents the community, symbolizing its interconnectedness and shared aspirations. Radiating from this hub are various branches, each representing a unique nonprofit organization. These branches, infused with distinctive colors and symbols, signify nonprofits' diversity and specialized functions.

As discussed earlier, the interactions between the number of nonprofits and community resiliency scores represent a complex relationship between different assets in a given community. By visually depicting these relationships, it is easier for stakeholders, policymakers, and the general public to identify and grasp the potential role(s) nonprofits can perform in building community resilience. This identification can help nonprofit organizations focus their efforts and resources on strengthening those key assets needed to promote resilience effectively. Most importantly, identifying critical components of an asset-based approach can help develop and implement targeted interventions where specific assets may be lacking or underutilized. This understanding can lead to strengthening those areas and creating more resilient communities.

Conclusions

The interplay of community resilience and nonprofits in Mississippi presents a complex and dynamic challenge. The state of Mississippi is prone to various natural disasters, economic disparities, and social issues that impact the well-being of its communities. Nonprofit organizations play a crucial role in addressing these challenges. This research conducted a quantitative analysis of community resilience measurements and their potential association with the number of nonprofit organizations in Mississippi. A dual-pronged approach was utilized that examined the statistical associations between the numerical presence of nonprofits and community resilience scores at the county level, and delved into the qualitative aspects that empower nonprofits to act as catalysts for community and resiliency-building. Study results showed statistically significant relationships between the number of nonprofits in a county and that county's community resiliency score at the statewide, urban, and rural geographic levels.

One of the goals of this comprehensive inquiry was to provide a holistic understanding of the intricate relationship between nonprofit organizations and community resilience, thereby offering valuable insights for academic discourse and practical policy considerations. In the face of what appears to be an increase in the number and occurrence of disasters and their impacts, a substantial reduction in human and property losses could be realized through proactive preparedness and mitigation efforts by nonprofits, individuals, and other community stakeholders. The "Asset-Based Approach to Improving Community Vulnerability" discussed earlier holds promise for getting communities with fewer nonprofits to build and expand upon their existing assets. This building and expanding upon existing assets can help those communities increase their resiliency and recovery abilities.

This research holds significant importance as it sheds light on the critical role and impact that nonprofit organizations play, or can potentially play, during times of crisis. Nonprofits often act as vital

pillars of support in disaster response and recovery efforts, providing essential services and resources to affected communities. Understanding the extent of their involvement and influence in disaster management can help leaders recognize their potential contributions and leverage their expertise more effectively. This study's findings can be used to help create a framework for identifying areas where nonprofits may require additional support to enhance resilience strategies using targeted interventions such as disaster training, capacity building, and disaster funding. By pinpointing specific needs, policymakers and funders can allocate resources more efficiently, ensuring nonprofits are well-equipped to respond before, during, and after emergencies. Strengthening the capacity of these organizations can lead to more robust and sustainable disaster response and recovery efforts, benefiting the communities they serve. By utilizing findings from this study to further unravel the interplay between nonprofit organizations and community resilience, policymakers, community organizations, and local residents will be in a better and stronger position to design and implement interventions to not only endure, but overcome and recover from natural and man-made disasters.

Study Limitations

While this research has yielded findings indicating a positive correlation between community resilience estimates and various factors, it is essential to acknowledge the limitations inherent in this study. These limitations provide valuable context and insights into the scope and applicability of study results. These limitations include:

i.   Although a connection between community resilience and nonprofit availability has been acknowledged, this study did not extensively investigate the potential association between the specific missions of individual nonprofits. Additionally, a detailed stratification of nonprofits according to their IRS classifications or NTEE codes was not undertaken, which could provide deeper insights into their contributions.

ii. Delays in data updates for Tax-Exempt Organizations within the IRS system have been encountered, partially attributable to administrative and procedural disruptions caused by the ongoing COVID-19 pandemic. This has led to a lag in processing paper-filed 990 series forms for organizations established in 2021 and beyond.

iii. The presence of duplicates within the business file emerged as an identified concern. Although included in the business file, these duplicates challenged data accuracy and consistency.

iv. The analysis of IRS charitable donations did not exclude defunct or revoked organizations, potentially influencing the outcomes and interpretations of the study's findings.

v.   While correlation analysis was a suitable model for testing the hypotheses, it is important to note that correlation alone does not establish causation. While it identifies a relationship between variables, it does not provide insights into the direction or strength of influence one variable has on the other.

vi. While using data from the Community Resilience Estimates (CRE), there is no distinction of which risk factors are associated with any group. For example, 0-1 risk factor estimates could be any selection of binary components.

vii. In evaluating the Jackson MSA and Rural MS regions, significance determination encountered limitations due to a low case count. As a result, confidence intervals could not be reliably computed, making the significance determination inconclusive for these specific areas. This highlights the

sensitivity of statistical analysis to sample size and reinforces the need for caution in drawing conclusions based on limited data.

viii. While inputting data from the Community Resilience Estimates (CRE), there is no distinction of which risk factors are associated with any group. For example, 0-1 risk factor estimates could be any selection of binary components.

Recommendations

In response to the imperative to enhance community resilience and bolster disaster preparedness, a comprehensive set of policy recommendations has been formulated. These recommendations aim to address key facets of evidence-based impact assessment, community risk assessments, holistic disaster planning, public education campaigns, resilient infrastructure advocacy, cross-sector collaboration, specialized support for vulnerable groups, community-led emergency response, nature-based solutions, nonprofit capacity building, skill development, regional resilience networks, and the pursuit of continuous improvement. Collectively, the recommendations provided below can assist communities in becoming more resilient and resilient-oriented:

a. Establish a systematic framework to assess the outcomes of nonprofit interventions. Regularly monitor changes in community assets before and after interventions to quantitatively measure the impact on enhancing community resilience.

b. Collaborate with MEMA and local government agencies to conduct comprehensive risk assessments. Engage experts and community stakeholders to identify hazards and vulnerabilities that pose significant threats to the community.

c. Develop disaster plans that address a spectrum of potential hazards, including those specific to the region. Foster collaboration among MEMA, local agencies, and nonprofit organizations used in the COVID-19 pandemic to ensure comprehensive and up-to-date plans.

d. Collaborate with MEMA, local agencies, and the MS Public Broadcasting System to design public awareness campaigns catering to diverse population segments.

e. Partner with MS Development Authority, MS Economic Council, and local agencies to advocate for resilient infrastructure investments. Utilize research findings to highlight the economic and social benefits of enhanced infrastructure.

f. Foster partnerships between nonprofit organizations, local agencies, businesses, and academic institutions like Jackson State University. Create knowledge-sharing, resource pooling, and joint planning platforms to enhance disaster resilience.

g. Engage MEMA, local agencies, Jackson State University, and Entergy to establish and empower Community Emergency Response Teams (CERT).

h. Partner with MEMA, local agencies, the Secretary of State, and nonprofit leaders and foundations such as Kellogg and Robert Wood Johnson to offer capacity-building programs for nonprofit organizations involved in disaster response.

i. Engage with MEMA, local agencies, nonprofit organizations, state and municipal governments, and Jackson State University to participate in regional and state-level resilience networks.

j. Share best practices, experiences, and resources to foster cross-learning and collaboration.

Future Research

As the field of community resilience within social science continues to advance, a compelling opportunity exists for further exploration and refinement. Additional analyses could delve into the potential benefits of incorporating weighted indicators, validating existing indicators, scrutinizing specific indicators concerning varying risks, and considering the introduction or removal of indicators altogether. Methodologies such as Principal Component Analysis, Factor Analysis, Regression Analysis, and Structured Sensitivity Analysis offer avenues for uncovering insights into individual indicators' comparative significance and impact on the broader construct of resilience. Furthermore, an intriguing avenue for investigation lies in understanding how these indicators might manifest distinct effects in rural versus urban settings and regional disparities. This line of inquiry could unearth insights into the contextual nuances that shape the significance of resilience indicators across different geographical and demographic contexts.

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