



AN ASSESSMENT OF SOCIAL VULNERABILITY AND RESILIENCY IN WISCONSIN EMERGENCY MANAGEMENT PLANNING

August 2, 2022

Co-Authors:

Samantha June Larson, PhD

Renee Christensen, MPA Student and Research Assistant

Master of Public Administration Student Contributors:

Elizabeth Bouche, Melissa Malchow, Regan Rule, and Choutae Yang



Whitburn Center for
Governance and Policy Research

800 Algoma Blvd., Oshkosh, WI 54901

(920) 424-1580

uwosh.edu/whitburn-center/

About the Whitburn Center

Mission Statement

The Whitburn Center conducts practical applied research focused on evaluating and improving governance, professional management, and public policy in Wisconsin and beyond.

Philosophy and Values

Our vision is to build local government, nonprofit, and community capacity to promote the common good. We will bring people together across ideological divides to discover nonpartisan solutions. The Whitburn Center will share innovative, research-based knowledge, equipping our partners to address their most pressing needs, while utilizing equitable, efficient, and effective strategies.

Advisory Board Members

- Gerald Whitburn, Ex-Officio Member and Founding Donor
- Scott McCallum, Inaugural Advisory Board Chair
- Raymond P. Taffora, Member
- Ellen Nowak, Member
- Kathryn Schauf, Member
- Mark Rohloff, Member
- Benjamin Krumenauer, Member
- Sachin Shivaram, Member
- Christine Thomas, Member

Executive Summary

The Issue: Socially vulnerable groups are the most likely to suffer negative consequences when disaster strikes, whether it be in the form of extreme environmental hazards or public health crises like COVID-19. While emergency management departments create plans to mitigate and respond to such events, it has been found that such procedures seldom account for the most socially vulnerable and highest risk populations (Gooden et al. 2009). This oversight can accentuate adverse impacts and inequities amongst historically disadvantaged groups.

The Method: In the Fall of 2021, UW Oshkosh Master of Public Administration students in MPA 797: Equitable and Resilient Communities conducted social equity analyses of Emergency Operation Plans and Hazard Mitigation Plans prepared by emergency management departments. An assessment of six counties in Wisconsin are included in this report: Barron, Brown, Columbia, Marathon, Outagamie, and Winnebago Counties.

The class utilized scholarly literature, the Comprehensive Racial Equity Analysis Tool from the City of Madison Racial Equity & Social Justice Initiative (RESJI), and the U.S. Climate Resilience Toolkit to inform their evaluations. Some of the key questions they examined included:

- What do available data tell you about the issue?
- What factors might be affecting socially vulnerable groups differently?
- Are there potential disproportionate impacts on communities of color or low-income communities?
- Have stakeholders from different racial/ethnic and socioeconomic groups been informed, involved and represented in the development of this proposal or plan?

The Findings: The following themes emerged from the social equity analyses across each county:

- Data from the Center for Disease Control and Prevention's (CDC) Social Vulnerability Index suggests that the sample of six counties range from low to moderate vulnerability.
- The Hazard and Vulnerability Research Institute's Baseline Resilience Indicators for Communities (BRIC) index shows resilience ranges from medium to medium-high in these counties.
- There is a lack of mention related to socially vulnerable populations within emergency management plans.
- Factors that affect socially vulnerable groups include but are not limited to: location of resident households, language barriers, lack of private transportation, and lack of financial resources.
- Engagement of vulnerable populations is limited in the planning process. There is an opportunity to gather greater input for how to best provide aid to these groups in times of need.

The Lesson:

- Engagement of socially vulnerable groups in the planning process is essential to identify specific needs and barriers, and how to best provide equitable disaster response. A continuum of community engagement is provided and can be used as a resource in future planning efforts.
- Future mitigation and response efforts can further consider the extent to which adaptive capacities are incorporated into the planning process to build resilience to future disasters. Four primary sets of adaptive capacities are noted in the recommendations section: Economic Development, Social Capital, Community Competence, and Information & Communication.

Introduction: Social Vulnerability and Emergency Management Planning

Social vulnerability is conceptualized in multiple ways. For the purposes of this report, it is defined as: “a measure of both the sensitivity of a population to natural hazards and its ability to respond to and recover from the impacts of hazards” (Cutter & Finch, 2008, p. 2301). Socially vulnerable groups are the most likely to suffer negative consequences when disaster strikes, whether it be in the form of environmental hazards such as extreme heat, storms, flooding, or public health crises like COVID-19.

Numerous studies have shown that vulnerability is associated with demographic characteristics such as race, ethnicity, age, gender, socio-economic status, disability, and residents who are Limited-English Proficient (LEP), amongst other factors (Cutter et al., 2003; Flanagan et al., 2018). People within these groups tend to be at greater risk of adverse impacts. Creating emergency management documents that promote *social equity*, which is defined as the fair, just and equitable management and distribution of public services and implementation of public policy, can help to promote a more equitable emergency response to these socially vulnerable groups (National Academy of Public Administration, 2021).

Emergency management departments create plans to mitigate and respond to such hazardous events. For instance, the goal of Emergency Operation Plans (EOP) is to lay out the framework for mitigation, preparedness, response, and recovery efforts in times of local emergencies (McEntire & Dawson, 2007). These plans aim to incorporate a network of community systems, including healthcare, local business, fire, police, EMS, and nonprofit organizations, and they develop action items to assist residents in coping with disasters and minimizing risk. The EOP is a critical doc-

ument that delegates specific responsibilities to the community systems listed earlier, to carry out essential mitigation efforts.

Similarly, Hazard Mitigation Plans (HMPs) aim to reduce loss of life and property through minimizing disaster impacts, identifying vulnerabilities within a certain jurisdiction, and developing strategies to reduce future disaster destruction (FEMA, 2021). These plans oftentimes will address specific emergency situations that are unique to the local jurisdictions, such as flood prone regions and areas susceptible to mudslides.

EOPs and HMPs are both foundational documents of local emergency management. Without them, communities are vulnerable to unstructured and unplanned natural disaster response. However, it has been found that such plans seldom take the most socially vulnerable (and highest risk) populations into consideration (Gooden et al. 2009). This can contribute to a community’s resilience, or lack thereof. Norris et al. (2008) define *community resilience* as a process that requires a network of community resources in order to adapt after a disturbance. They refer to these resources as *adaptive capacities*. Their research has shown: “To build collective resilience, communities must reduce risk and resource inequities, engage local people in mitigation, create organizational linkages, boost and protect social supports, and plan for not having a plan, which requires flexibility, decision-making skills, and trusted sources of information that function in the face of unknowns” (p. 127). Thus, oversight of socially vulnerable groups in emergency management plans and limited adaptive capacities can accentuate adverse impacts amongst historically disadvantaged groups.

Analytic Approach

In the Fall of 2021, UW Oshkosh Master of Public Administration students in *MPA 797: Equitable and Resilient Communities* conducted social equity analyses of EOPs and HMPs prepared by emergency management departments. Their assessments of six Wisconsin counties are included in this report: Barron, Brown, Columbia, Marathon, Outagamie, and Winnebago Counties. To gain a better understanding of the proportion of socially vulnerable groups in each county, demographic data for each county is provided in Table 1 (US Census Bureau, 2019). The representation of each group for the State of Wisconsin is also included on the bottom row, which serves as a point of comparison for each county.

Table 1 provides valuable information to assist in identifying which people may be more at risk within their respective counties. For instance, Brown County has the largest population of all counties in the analysis and possesses the greatest percentage of people of color (19.2%), people who speak English less than “very well” (4.5%), and families living below the poverty level (6.7%). Each of those indicators are higher than the state average. Barron County has the highest percentage of elderly residents, at 21.4%

total population being 65 years or older, as well as the highest number of people with disabilities, at 14.4%. Both of those indicators are also higher than the state average.

StStudents utilized scholarly literature, the Comprehensive Racial Equity Analysis Tool from the City of Madison Racial Equity & Social Justice Initiative (RESJI), and the U.S. Climate Resilience Toolkit to inform their evaluations of the counties above. Some of the key questions they examined included:

- What do available data tell you about the issue?
- What factors might be affecting socially vulnerable groups differently?
- Are there potential disproportionate impacts on communities of color or low-income communities?
- Have stakeholders from different racial/ethnic and socioeconomic groups been informed, involved and represented in the development of this proposal or plan?

The following section summarizes what each student researcher discovered in their analysis of these questions. It also provides specific take-aways from their reports.

County	Pop.	People of Color (%)	Disability (%)	Speak English less than “very well” (%)	65 and Older (%)	Families below Poverty Level (%)	Owner-occupied Housing Unit Rate (%)	Median Household Income (\$)
Barron	45,229	6.7	14.4	1.6	21.4	5.8	74.7	\$52,703
Brown	261,368	19.2	10.7	4.5	14.4	6.7	64.8	\$62,340
Columbia	57,133	7.4	11.6	1.7	17.4	5.0	74.4	\$68,005
Marathon	135,396	11.3	11.4	2.8	17.1	5.7	72.2	\$62,633
Outagamie	185,700	12.5	10.2	2.3	14.3	5.9	71.1	\$65,572
Winnebago	170,411	11.3	11.9	2.2	15.9	6.0	65.2	\$58,543
Wisconsin	5,790,716	12.4	11.7	3.1	16.5	6.2	67.0	\$61,747

Table 1. County Demographics

Findings

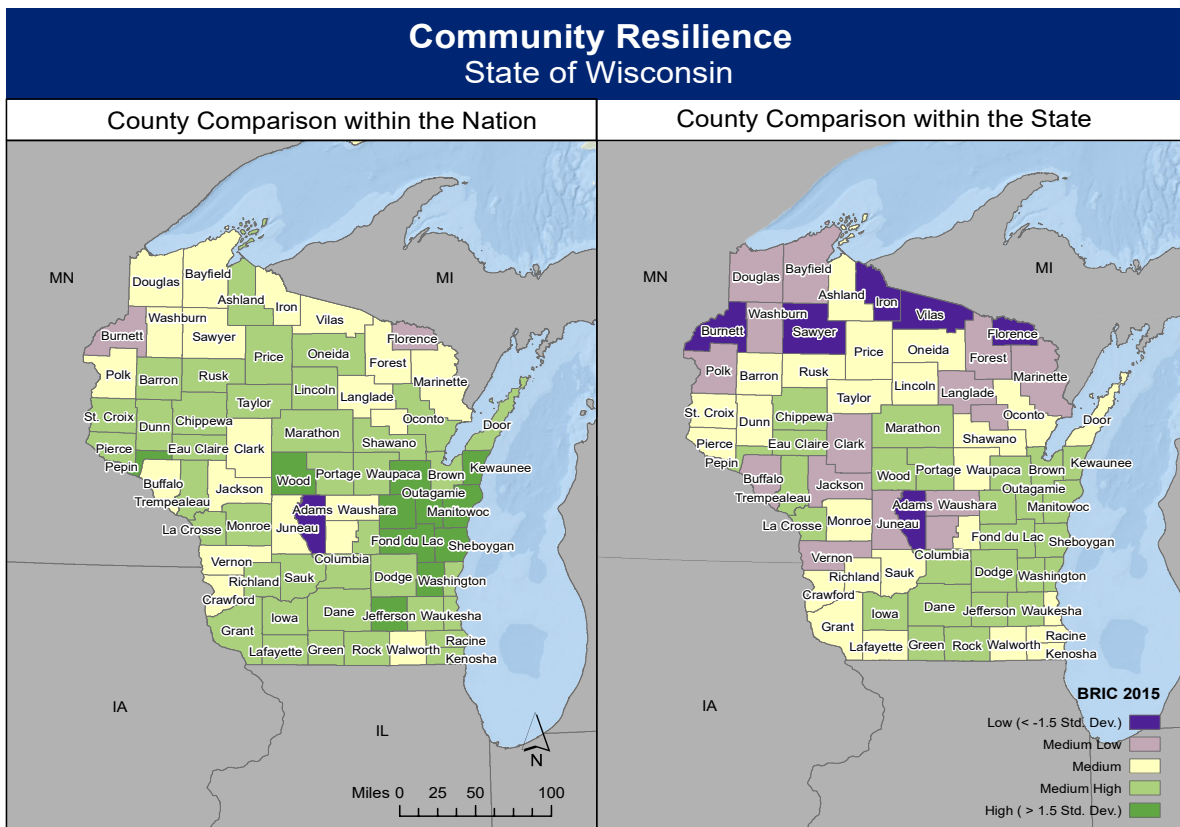
What do available data tell you about the issue?

First, a measure of social vulnerability and community resilience was collected for each county. Social vulnerability was determined using the Social Vulnerability Index (SVI) developed by the CDC. The SVI uses 15 census variables (e.g. poverty rate, lack of vehicle access, and crowded housing) to measure the potential negative effects communities may suffer due to natural or human-caused disasters (CDC, 2018). Notably, many of the indicators included in Table 1 correlate with those used to determine SVI scores. The index scores a community's level of vulnerability on a scale of 0-1, with 0 being lowest vulnerability, 1 being highest vulnerability.

Next, a measure of community resilience was collected using the Baseline Resilience Indicators for Communities (BRIC) Index, a project developed by the Hazards Vulnerability & Resilience Institute

at the University of South Carolina. The BRIC index measures community resilience using six categories related to disaster resilience: social, economic, community capital, institutional, infrastructural, and environmental (Hazard Vulnerability & Research Institute, 2015). Again, several of the indicators included in Table 1 are also included to determine BRIC scores.

Specific variables from each category are measured on a scale of 0-1, with "0" being no resilience and "1" being very high resilience. This rat-



Baseline Resilience Indicators for Communities (BRIC) 2015



Figure 1. Wisconsin Baseline Resilience Indicators for Communities (BRIC) Index

ing is beneficial when comparing communities, determining key drivers to resilience, and identifying areas of resiliency improvement (Hazard Vulnerability & Research Institute, 2015). The level of community resilience for all counties in Wisconsin is provided in Figure 1, which includes how the county compares with the rest of the Nation (pictured left) and how it compares to other counties within the State of Wisconsin.

SVI and BRIC scores collected for the six counties analyzed for this report are provided in Table 2 below. In comparing all counties, there is a variation of 0.2321 in terms of SVI scores. Barron and Brown County produce a moderate level of social vulnerability, whereas the remaining four counties exhibit low levels. Comparatively, the level of community resilience in these counties ranges from Medium in Barron County to Medium-High in the five other counties under investigation.

Next, students examined the EOP or HMP for each county to determine the extent to which the plan mentioned four socially vulnerable groups: people with disabilities, the elderly, low-income

individuals, and Limited-English Proficient (LEP) speaking groups. Derivatives for each of these terms were also included in their analyses (for instance, another search terms for “elderly” may include senior citizen). Notably, this was a non-exhaustive list and does not include all vulnerable groups within each county. It serves as one example of how communities may be accounting for vulnerable people in their emergency preparedness documents.

The findings are presented in Table 3, which includes each county and the number of times each vulnerable group was mentioned in their plan. The number of mentions each county plan made of specific vulnerable groups varies. The most frequently mentioned group was people with disabilities (40) by all counties in this analysis. The next highest group included were the elderly (17), which were mentioned in five out of six plans. LEP speakers were noted in four out of six plans. In terms of least frequently mentioned, there was no mention pertaining to low-income residents in four of the six county plans.

County	Region	SVI (2018)	State BRIC (2015)
Barron	Northwest	Moderate (0.3271)	Medium
Brown	East Central	Moderate (0.3299)	Medium-High
Columbia	Southwest	Low (0.1204)	Medium-High
Marathon	Northeast	Low (0.1442)	Medium-High
Outagamie	East Central	Low (0.0978)	Medium-High
Winnebago	East Central	Low (0.1235)	Medium-High

Table 2. SVI and BRIC Scores by County

County	Plan	Disabilities	Elderly	Low-Income	LEP	Total
Barron	EOP	4	1	2	0	7
Brown	EOP	3	7	0	2	12
Columbia	HMP	2	5	2	0	9
Marathon	EOP	21	0	0	2	23
Outagamie	EOP	2	1	0	1	4
Winnebago	EOP	8	3	0	1	12
	Total	40	17	4	6	67

Table 3. Mention of Socially Vulnerable Groups in Emergency Management Plans

What factors might be affecting socially vulnerable groups differently?

One of the main factors noted by students was the lack of consideration of socially vulnerable groups in the preplanning process. All six analyses referenced the emergency plan’s lack of mention regarding vulnerable groups in general, and there was no specific plan development in terms of how to further engage or provide services to marginalized groups.

For instance, one student noted that their EOP did not mention those with limited English-language proficiency, neither in its demographic description of the community, nor in the mitigation strategies describing how to communicate disaster information with the public. As a consequence, this group remains overlooked in the planning and remains more vulnerable due to lack of equitable access to disaster information. Notably, the “Communications and Warning” plan included no mention at all of language barrier consideration.

Another student noted that the “Communication” section of their EOP, which serves as the guiding document for providing guidance for rapid alerting and warning to the public, speaks in general terms of how the county will approach communication efforts. However, it did not address how the county plans to issue alerts for lim-

ited-English speaking individuals or those that may be hard of hearing or deaf. This is another concern as resources may not be adequately prepared during an emergency to support those communities if planning failed to account for those individuals.

Are there potential disproportionate impacts on communities of color or low-income communities?

Factors that may result in disproportionate impacts on socially vulnerable communities were identified across all counties. As one student stated, there was no reference made for lower-income individuals living in zero vehicle households. These people are negatively impacted compared to those with private transportation due to their inability to mobilize efficiently in times of crisis. Furthermore, persons with limited English-language proficiency were almost three times as likely to report using public transit as their primary means of transportation compared to English speakers (Federal Transit Administration, 2007). This means that, in addition to increased vulnerability from communication issues, these same people are also at increased risk of not being able to evacuate in an emergency if needed.

Have stakeholders from different racial/ethnic and socioeconomic groups been informed, involved, and represented in the development of this proposal or plan?

Mention of how information was being transmitted from the planning process to the public was minimal across the analyses. One student noted that outreach in their county was limited to the distribution of a PDF attachment emailed to municipal governments. The PDF is a brochure titled “Pre-Disaster Mitigation Planning” that was printable in English only. Therefore, LEP speakers and residents who are unaware of the document’s existence cannot be informed by the document.

Barriers to stakeholder involvement were also noted in all analyses. As one student pointed out, the structure of public outreach and engagement are factors present in the creation of this document that may potentially affect people of color and low-income populations. In one county, public engagement was limited to six meetings. All were held in the same location, and only one of the six meetings was held after 5p.m. Such a meeting schedule can limit those who are transportation-disadvantaged (such as people with disabilities and elderly groups) from full participation. Likewise working people who are not able to attend during the late morning and afternoon scheduled meetings may not be able to engage in the planning process and provide input directly. Finally, engagement, outreach, and representation of socially vulnerable groups on planning committees was reportedly low as noted by each student in their analysis. This sheds light on the communication gap that exists between committees, emergency response agencies, and residents at large. Without a streamlined approach for emergency information communication, that is offered using diverse methods and languages to best serve their communities, EOPs and HMPs

cannot be deployed effectively if people do not receive and interpret the information.

Recommendations

Several suggestions were provided by students as a result of their analyses. These are briefly discussed in this final section. References are provided to tools that can be utilized to advance incorporation of socially vulnerable groups in planning efforts with the goal of building community resilience.

First, planning committees can develop an additional section to EOPs and HMPs that specifically focuses on addressing the risks and needs of vulnerable populations throughout their county. By including a specific annex that includes detail and explanation surrounding vulnerable populations, a plan could intentionally incorporate details to best deploy emergency services to these vulnerable populations in times of need (Gooden et al., 2009). Quantitative data is available to determine which groups may be at higher risk. For instance, demographic information included in this report from the U.S. Census, Social Vulnerability Index, and Baseline Resilience Indicators for Communities Index can inform this section. More specifically, the SVI also includes census tract data for each county, all possessing their own specific score. For instance, when looking at Brown County, there is a cluster of census tracts in the central portion of the county that possess a high level of vulnerability, ranging from 0.7965-.9594, which is significantly higher than the county as a whole (CDC, 2018). This area encompasses the downtown region of Green Bay. This information can be utilized by emergency managers to designate where additional resources may be allocated appropriately to address vulnerable populations responsibly.

Second, future revisions to EOPs and HMPs can

strive for a more inclusive process of public engagement, specifically recruiting people within vulnerable groups to serve on planning committees. Each of the six analyses revealed little acknowledgement in terms of how aid was going to be specifically delivered to the elderly, people with disabilities, low-income households, and LEP speaking residents. The lack of engagement from these groups can make the job of emergency management departments and first responders more difficult if they are not aware of the needs that these special populations.

Several students recommended utilizing the City of Madison Wisconsin’s Racial Equity and Social Justice Community Engagement Continuum for this purpose. This tool (Figure 2) acts as a roadmap for navigating diverse ways to engage the community in program processes. It provides

strategies for increasing citizen participation in local government decision making, with the goal of engaging a diverse body of people who will be impacted by the outcomes of a project or program. The type of engagement may vary depending on circumstances. Therefore, understanding the different levels, characteristics, and strategies of citizen engagement can help to facilitate successful processes.

Finally, future planning efforts can also consider the extent to which adaptive capacities to respond and recover from disaster are present in their counties. Adaptive capacities refer to the resources that are available within a community during emergency response, and the ability of those resources to transform dependent on circumstances. Norris et al. (2008) stated there are four sets of adaptive capacities for community re-

Levels of Engagement				
City Informs City of Madison initiates an effort, coordinates with departments and uses a variety of channels to inform community to take action	City Consults City of Madison gathers information from the community to inform city-led projects	City engages in dialogue City of Madison engages community members to shape city priorities and plans	City and community work together Community and City of Madison share in decision-making to co-create solutions together	Community directs action Community initiates and directs strategy and action with participation and technical assistance from the City of Madison
Characteristics of Engagement				
<ul style="list-style-type: none"> Primarily one-way channel of communication One interaction Term-limited to event Addresses immediate need of City and community 	<ul style="list-style-type: none"> Primarily one-way channel of communication One to multiple interactions Short to medium-term Shapes and informs city projects 	<ul style="list-style-type: none"> Two-way channel of communication Multiple interactions Medium to long-term Advancement of solutions to complex problems 	<ul style="list-style-type: none"> Two-way channel of communication Multiple interactions Medium to long-term Advancement of solutions to complex problems 	<ul style="list-style-type: none"> Two-way channel of communication Multiple interactions Medium to long-term Advancement of solutions to complex problems
Strategies				
Media releases, brochures, pamphlets, outreach to vulnerable populations, ethnic media contacts, translated information, staff outreach to residents, new and social media	Focus groups, interviews, community surveys	Forums, advisory boards, stakeholder involvement, coalitions, policy development and advocacy, including legislative briefings and testimony, workshops, community-wide events	Co-led community meetings, advisory boards, coalitions and partnerships, policy development and advocacy, including legislative briefings and testimony	Community-led planning efforts, community-hosted forums, collaborative partnerships, coalitions, policy development and advocacy, including legislative briefings and testimony

Figure 2. City of Madison Racial Equity and Social Justice Community Engagement Continuum

silience: Economic Development, Social Capital, Information & Communication, and Community Competence. These are illustrated in Figure 3, along with subcategories that fall under each set.

A community's ability to withstand stressors is dependent on how they exercise these attributes within their context. For instance, in the Economic Development category, communities must incorporate Equity of Resource Distribution. Low-income communities are at greater risk for death and damage when disasters occur. They are less successful in mobilizing support. Therefore, the ability to distribute resources to those who most need them before and after a disaster is vital. Regarding the Community Competence category, Norris et al. (2008) have also noted that engaging local people in mitigation efforts is critical. This further highlights the opportunity to utilize the continuum above work toward higher levels of engagement, such as community forums or other collaborative partnerships.

Conclusion

This assessment offers a snapshot of the extent to which social vulnerability is included in emergency management planning efforts in six Wisconsin counties. It also provides some recommendations of areas to build resiliency in the process. Two areas of investigation are important for future analysis. First, counties with high social vulnerability should be prioritized for further evaluation. Second, the degree of adaptive capacities in each county is important to understand from the perspective of county emergency management personnel. It is important to gain further understanding of the resources they need to best fulfill their roles and missions to mitigate disasters in their respective counties.

Notably, the Whitburn Center has received a grant from the UWO Sustainability Institute for Regional Transformations to further explore

these issues in 2022-2023. The project will include examination of 14 counties in East Central Wisconsin. We will be seeking input from county level emergency management professionals on areas of strength and need. Results of that study will be shared widely upon completion of the grant-funded research project.

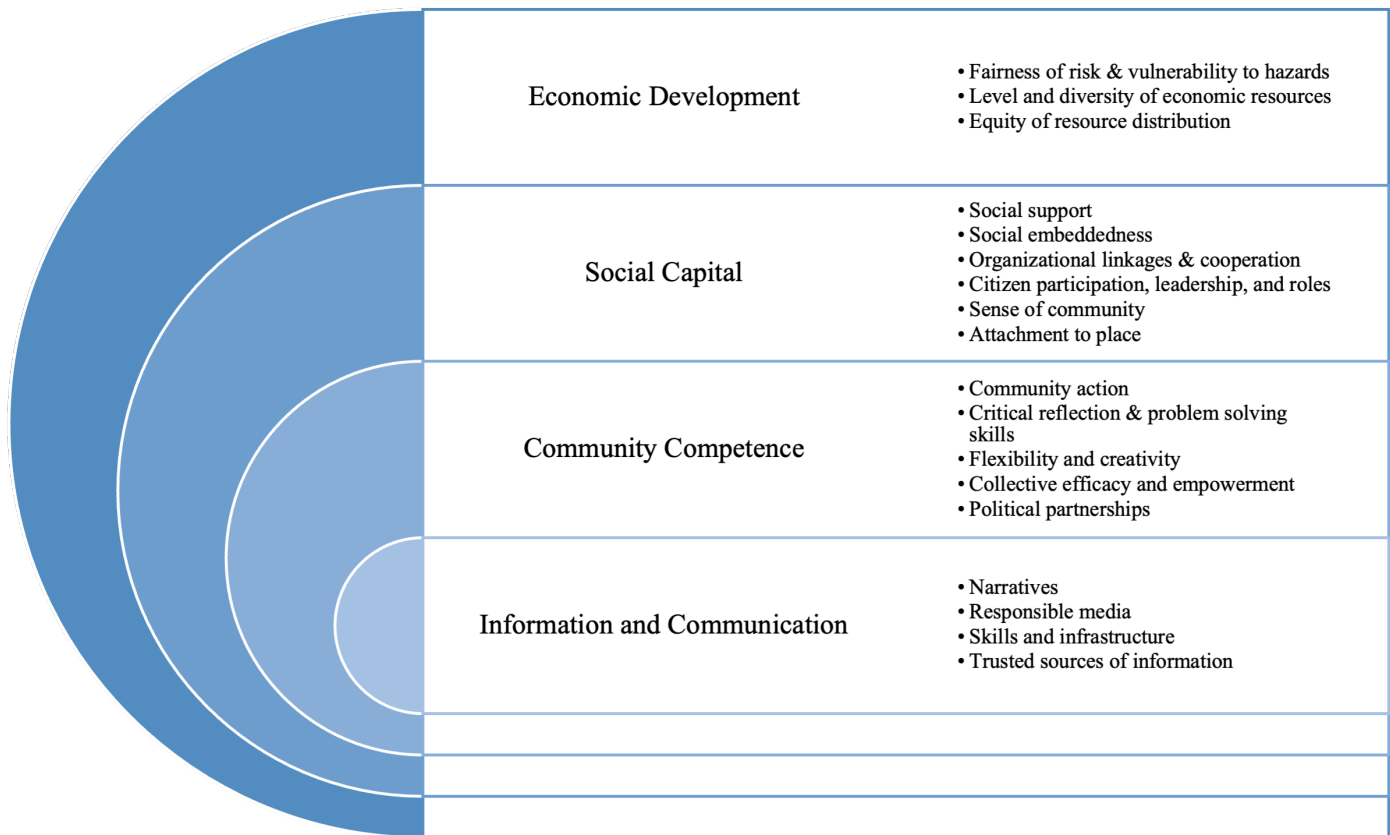


Figure 3. Adaptive Capacities Framework

References

- Centers for Disease Control and Prevention. (2018). CDC's Social vulnerability index (SVI). Centers for Disease Control and Prevention. <https://svi.cdc.gov/map.html>.
- Cutter, S. L., & Finch, C. (2008). Temporal and spatial changes in social vulnerability to natural hazards. *Proceedings of the National Academy of Sciences*, 105(7), 2301-2306.
- Cutter, S. L., Boruff, B. J., & Shirley, W. L. (2003). Social vulnerability to environmental hazards. *Social Science Quarterly*, 84(2), 242-261.
- Flanagan, B. E., Hallisey, E. J., Adams, E., & Lavery, A. (2018). Measuring community vulnerability to natural and anthropogenic hazards: the Centers for Disease Control and Prevention's Social Vulnerability Index. *Journal of Environmental Health*, 80(10), 34-36.
- Gooden, S., Jones, D., Martin, K. J., & Boyd, M. (2009). Social equity in local emergency management planning. *State and Local Government Review*, 41(1), 1-12.
- Hazards Vulnerability & Resilience Institute. (2015). Baseline resilience indicators for communities data. University of South Carolina. sc.edu/study/colleges_schools/artsandsciences/centers_and_institutes/hvri/.
- McEntire, David A., and Gregg Dawson. 2007. The intergovernmental context. *Emergency management: Principles and practice for local government*. 2nd ed., ed. William L. Waugh Jr. and Kathleen Tierney. Washington, DC: International City/County Management Association Press.
- National Academy of Public Administration. (2020). Foster Social Equity. <https://napawash.org/grand-challenges/foster-social-equity>
- 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), 127-150.
- Racial Equity and Social Justice Initiative. (2021). Racial equity and social justice tool. City of Madison Civil Rights. www.cityofmadison.com/civil-rights/programs/racial-equity-social-justice-initiative/analysis-tools.
- U.S. Census Bureau (2020). 2019 American Community Survey 5-year estimates. <https://data.census.gov/>.
- U.S. Department of Homeland Security. (2022). Hazard mitigation planning. FEMA. Retrieved from <https://www.fema.gov/emergency-managers/risk-management/hazard-mitigation-planning>.