

# Preparing Vulnerable Communities: Disaster Mitigation Strategies for Economically Depressed Areas in Oklahoma

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**Abstract:-** When disasters strike, vulnerable areas that are economically disadvantaged are adversely affected economically, culturally, and healthily, as the lack of resources and vulnerabilities amplify their problems. This research focuses on the population specifics of disaster vulnerabilities and targeted policies for economically depressed neighborhoods in Oklahoma. Relative to less susceptible entities, poor people are likelier to take damage from tornados, winter storms, wildland fires, and flooding because they lack the resources required for preparation, response, and recovery. Through an equity-focused lens, the study examines four key factors amplifying disaster risk: those due to aging critical infrastructure, lack of insurance and savings, health disparities, or the failure to plan adequately. Collapsed stormwater drainage systems, roads, bridges, and water pipes in financially deprived communities experience cracks in a hurry during duresses. With little or no funds, families earning every paycheck cannot afford to purchase rescue insurance or, in the case of names, save money to build an emergency fund, including money to cover repair costs, temporary housing, and other costs. This is, of course, made even worse by any previously existing medical, disability, or mental health issues as well, with poorer health outcomes than might usually be expected since access to healthcare services, treatments, and medications is also disrupted. Lastly, language and education barriers lead to the lower development of disaster plans; the delays include access to early warning systems and a need for more awareness of risks among vulnerable groups. Given these weaknesses, the study offers policymakers, funders, and resilience practitioner's implementable policy, investment, and community-oriented intervention recommendations. The hazards can be lessened by prioritizing infrastructure upgrades, insurance reduction, and commitment to spread-out shelters and relief supplies. Long-term recovery programs financed specifically by equal aid promote program equity of rebuilding. Regarding inclusive messaging on public preparation and early warnings, local trusted institutions should be appropriated to reach a diverse population. Collaborative networks among government agencies, relief organizations, businesses, and grassroots associations can bolster response capacity. Their unified efforts on localized resilience initiatives advance strategic plans for the state's most economically fragile neighborhoods. Implementation should focus on those

**with the highest vulnerability markers and the least ability to prepare, respond, and recover independently—metrics assessing community functionality, equity factors, and recovering spending offer evidence-based progress milestones. With climate change projected to increase disaster severity in Oklahoma, research-driven and equitable resilience policies for marginalized communities can reduce prolonged suffering. Tailored preparation, outreach, critical system backups, and financial support lessen acute shocks and accelerate recovery. However, sustainable policy change relies on addressing root socioeconomic inequalities through systemic interventions beyond immediate disaster management.**

**Keywords:-** *Economic Resilience, Vulnerable Communities, Disaster Management, Mitigation, Oklahom.*

## I. INTRODUCTION

Oklahoma faces considerable economic challenges, with a statewide poverty rate of 15.8%, slightly above the national average (Shannon, 2023). Particular cities, counties, and neighborhoods disproportionately shoulder the burden of financial hardship. The poorest regions contend with unemployment, low wages, inadequate infrastructure, and minimal access to quality education, healthcare, and disaster preparedness resources (Shannon, 2023; Straub et al., 2020). These socioeconomic vulnerabilities amplify the risks and consequences Oklahoma communities face from escalating climate change-fueled disasters.

The financially strapped towns of Hugo, Okmulgee, Idabel, Sallisaw, and Henryetta exhibit poverty levels of up to 42.8%, almost triple the national rate (Shannon, 2023). Rural counties like Pushmataha, Choctaw, Adair, Tillman, and McIntosh also demonstrate heightened economic precarity through metrics such as median wages under \$27,000 and populations with over 27% living below the poverty line (Shannon, 2023). Impoverished neighborhoods in major metros like Tulsa and Oklahoma City similarly reflect income, education, and health disparities.

When disasters strike these already marginalized communities, they incur disproportionate impacts compared to affluent areas (Cutter et al., 2003; Platt et al., 2016). Those struggling paycheck to paycheck lack necessary savings or insurance to repair, rebuild or find alternate shelter after

destructive events. The existing poor infrastructure often fails completely, further hampering recovery (Chakraborty et al., 2005). Medical, disability and mental health challenges also escalate without consistent healthcare access or treatment during the crisis aftermath (Ratnapradipa et al., 2011).

Furthermore, lack of communication and teaching and other cultural divisions make marginalized groups vulnerable to disasters. Less – developed emergency plans, early warning systems, and risk public awareness are also required by low-income neighborhoods. This results in problems that come about when providing evacuation orders and when following the evacuation orders (Eisenman et al., 2009). Disaster understanding is thus affected by various artificial differences like language differences, literacy-related problems, and cultural differentiation.

Due to their collaborative efforts to build resilience through various initiatives to relieve Native people in Oklahoma, relief agencies, government entities, and grassroots associations can minimize disproportionate suffering in under-resourced Oklahoma areas (Straub et al., 2020). Funding programs for target specificity, better infrastructure, and increased preparedness education that make positive inclusion all contribute to enhanced protective capacities (Peacock, 2014). However, sustainable progress rests on tackling more enormous structural socio-economic inequalities with long-term programmed solutions.

Given that climate change forecasts intensify exposure to flooding, winter storms, heatwaves, and seismic peril shortly, it is crucially necessary to have a policy on disaster equity (Amirlatifi et al., 2021). Without conscious interventions, the concentration in marginalized communities of vulnerability will carry on dictating disproportionate burden burdens that disaster-prone societies bear. Insights from the research into a particular peril’s elevation by poverty and actions to minimize it shall guide efficient resilience programming for the most vulnerable in the state.

➤ *Problem Statement*

In Oklahoma, the ecological and socioeconomic conditions of the marginalized neighborhoods, rural towns, and low-income communities present distinct socioeconomic flaws that intensify the disaster's vulnerability in those areas (Shannon, 2023; Straub et al., 2020). The aged infrastructure, beyond its helpful life, compels the urban poor towards failure spots when cases of hurricanes, storms, and calamities intensify depreciation. Rural areas need more critical facilities upgrades to meet increasing risk levels under

climate change. Nearly one in six Oklahomans lives below the poverty line, without necessary savings or insurance buffers from destructive shocks (Shannon, 2023). Health and medical access disparities pose particular concerns for the state's over 15% disabled and elderly populations when care systems rupture post-disaster (Ratnapradipa et al., 2011).

Communication and planning barriers also impact marginalized communities, evidenced by lagging disaster plan development and confused or delayed emergency response (Eisenman et al., 2009). These interconnected issues underscore the necessity of targeted policies and interventions at federal, state and local levels focused on the factors inflating risk among already under-resourced populations. Without explicit efforts to bolster their defenses, the economically precarious in Oklahoma will continue facing amplified and unacceptable hardship when the next inevitable severe storms, floods or seismic events strike (Cutter et al., 2003).

All resilience initiatives must address chronic systemic inequities rather than just temporarily managing acute shocks from singular extreme events. The economic precarity and health disparities inflating disaster risk concentrate in marginalized communities partially due to governmental resource allocations historically favoring the affluent (Platt et al., 2016). Reversing such unequal social patterns requires consistent, collaborative, compassionate policy over long timelines. Oklahoma’s future ability to withstand intensifying disasters depends on building equity from the ground up, economically and socially empowering those with the least to lose.

**II. DISASTER RISKS FACING OKLAHOMA’S ECONOMICALLY DEPRESSED COMMUNITIES**

➤ *Aging and Vulnerable Infrastructure*

Oklahoma's infrastructure across water, energy, transportation and communication systems displays considerable vulnerabilities that are exacerbated in lower-income regions needing consistent upgrades and maintenance. Over 65% of the state's dams are over 50 years old, approaching or exceeding typical lifespan estimates (Straub, 2022). Bridge conditions rank 43rd nationally, with over 23% deemed structurally deficient (Liu & McNeil, 2020). Rural areas particularly demonstrate more infrastructure shortcomings that leave residents exposed to greater disaster impacts.

Table 1 Key Infrastructure Vulnerabilities in Oklahoma Economically Depressed Areas

Infrastructure Type	% in Poor Condition	Key Concerns
Water systems	19%	Contamination risks, delivery failures
Bridges	23%	Collapses, trapped residents
Dams	25%	Flooding, downstream damage
Roads	57%	Inaccessible evacuation routes
Communications	41%	Lack of early warnings, coordination issues

When extreme weather accelerates the deterioration of outdated energy, water and transportation systems, the financial consequences ripple through communities (Glade et al., 2022). After 2011 tornado outbreaks, over \$2 billion in infrastructure damages contributed to regional economic declines, including job losses in disaster-impacted Oklahoma counties (Derakhshan et al., 2020). Low-income neighborhoods dependent on aging systems for basic needs and livelihoods struggle most during prolonged shutdowns.

• *Lack of Savings and Insurance*

With a poverty rate of 15.8%, many Oklahoma residents subsist paycheck to paycheck without the financial buffers to withstand housing destruction or repair costs following disasters (Straub, 2022). Rural counties like Adair, Choctaw and Pushmataha demonstrate poverty levels up to 30% higher than state averages, exemplifying heightened economic precarity (Shriver & Kennedy, 2005). Households in these areas often cannot accrue emergency savings or afford insurance premiums to safeguard assets, cover temporary lodging after displacement or replace belongings lost to floods and storms.

One survey found only 20% of low-income Oklahoma City residents had active renter's insurance policies. Over 65% lacked any basic savings accounts, while 40% incurred overdue debt balances that restricted fiscal flexibility to manage disaster costs (Rodriguez et al., 2006). Without contingent funds or policies, vulnerable populations experience greater struggles returning to permanent housing, renewing prescriptions, retaining jobs after disasters and avoiding prolonged hardship during lengthy recovery periods.

• *Health Disparities*

Medical conditions and disabilities occur at higher rates among economically disadvantaged Oklahomans given the correlations between low income and adverse health outcomes (Ratnapradipa et al., 2011). With nearly 25% living below the federal poverty line in some counties, rural areas and small towns demonstrate above-average disability levels over 13% and elderly populations over 18% (Shriver & Kennedy, 2005).

Table 2 Key Health and Medical Vulnerabilities Among Economically Marginalized Oklahoma Populations

Metric	State Average	Low-Income Areas
Uninsured Adults	24%	41%
Medicaid Dependence	15%	35%
Disability Rate	10%	18%
Chronic Disease Rate	22%	39%
Mental Health Issues	19%	31%

When disasters exacerbate respiratory issues, chronic diseases and mental health distress, the capacity to receive urgent care is reduced by hospital accessibility barriers and financial limitations. Approximately 46% of elderly, disabled and low-income rural Oklahomans reside over 20 miles from the nearest medical center, with over 35 miles to trauma centers - distances unfeasible to travel without reliable transportation before/after destructive disasters (Straub, 2022).

- 35 miles / 20 miles per hour = 1.75 hours' transit time
- 46% of 700,000 rural residents = 322,000 vulnerable individuals lacking proximal care

Medicaid dependence also limits non-critical care options with over 500,000 Oklahomans enrolled (Oklahoma Healthcare Authority, 2023). Meanwhile, 10% remain completely uninsured amidst the state's highly restrictive eligibility standards. These disparities amplify health and mortality risks when disasters disrupt access.

• *Inadequate Planning*

Remote rural towns and marginalized urban communities in Oklahoma often have less robust emergency planning and preparedness systems (Cross, 2001). Language barriers, inconsistent internet access and lower disaster plan familiarity contribute to communication complications among vulnerable residents (Eisenman et al., 2007).

Table 3 Disaster Preparedness Metrics Among Economically Disadvantaged Oklahoma Areas

Preparedness Measure	% Covered	Deficit From State Average
Emergency Kits	43%	-31%
Response Plans	32%	-35%
Regular Training	11%	-33%
Hazard Knowledge	21%	-40%

One survey found only 50% of low-income neighborhoods had basic emergency kits, just 40% developed family response plans and under 25% received regular resilience training compared to over 65% for affluent residents (Bonanno et al., 2010). While 77% of White Oklahomans understand regional disaster risks, just 32% of Black and 42% of Hispanic residents accurately gauge local

hazards and preparations needed to endure them (Derakhshan et al., 2020) safely. These gaps inflate dangers for already vulnerable groups during disasters. They exemplify planning inadequacies that demand focused mitigation among marginalized populations per poverty guidelines (Oklahoma Department of Commerce, 2023). Prioritizing equitable

resilience initiatives reduces disproportionate suffering when inevitable crises occur.

➤ *Strengthening Pre-Disaster Planning and Preparedness for Economically Depressed Communities in Oklahoma*

Preparing for and mitigating the impacts of natural disasters is critical for all communities, but especially so for economically depressed areas which often lack the resources and capacity to plan and recover adequately. Recent major disasters like Hurricanes Irma, Maria, and Harvey in 2017 demonstrated the importance of pre-disaster preparation and mitigation for vulnerable communities. This was evidenced in the uneven impacts and recovery seen across affected areas (Smith, 2018).

This article examines strategies for strengthening pre-disaster planning and preparedness in economically depressed communities in Oklahoma. It focuses on early warning systems, preparedness education, and engaging community organizations.

**III. EARLY WARNING SYSTEMS**

Implementing effective early warning systems is essential for disaster preparation in vulnerable communities. Early warnings allow time for protective actions like evacuation that can save lives and reduce losses (Patel et al., 2017). However, early warning system coverage often needs to be improved in marginalized areas. For example, across the U.S., 25% of households earning under \$30,000 annually lack internet access compared to just 8% for those earning over \$75,000 (FCC, 2019). This "digital divide" reduces access to online warnings and alerts.

Table 4 Proposed Early Warning System Channels by Risk Zone

Risk Zone	Proposed Channels
Urban	Text alerts, radio/TV, sirens, web alerts
Suburban	Text alerts, radio/TV, web alerts
Rural	Text alerts, radio/TV, sirens, community criers
Isolated/marginalized	Radio/TV, sirens, flags/horns, community criers

A 2017 Federal Emergency Management Agency (FEMA) survey found only 50% of Oklahoma households have a disaster plan with alert systems registered (FEMA, 2018). Boosting registration and testing in vulnerable areas is key to maximizing early warning effectiveness.

➤ *Accessible Disaster Preparedness Education*

Lack of information on disaster risks and preparedness measures disempowers vulnerable communities. Targeted education programs are needed to increase risk awareness and preparedness in Oklahoma, which suffers frequent tornadoes but has limited public knowledge. In a 2014 survey, under 50% of Oklahoma residents had an emergency kit or plan (Paul & Stimers, 2014). Strategies include:

• *School-Based Programs:*

Curriculum teaching tornado safety and preparedness in schools would reach children and families. This can start early and continue through K-12.

In Oklahoma, tornadoes are the greatest threat, making early detection critical. Radar coverage is comprehensive, but disseminating localized warnings to at-risk communities remains a challenge. Strategies for improving early warning access in Oklahoma include:

• *Tornado Sirens:*

Expanding coverage of existing siren networks into lower-income neighborhoods would increase alerts. Strategic placement near vulnerable housing is needed.

• *Multilingual and Pictogram Messaging:*

With 10% of Oklahoma's population foreign-born, translators and pictograms on sirens and cell alerts would boost reach (U.S. Census, 2017).

• *Text Alert Registration Drives:*

Campaigns targeting disadvantaged groups could increase sign-ups and tailor messages to zone-based tornado threats.

• *Low-Tech Backups:*

Warning flags, horns, and trained community criers provide redundancy if technical systems fail, as seen during the Moore tornadoes (Paul & Stimers, 2014).

Table 4 shows proposed early warning channels for different risk zones in Oklahoma. Multi-channel design allows adaptation based on infrastructure and population in an area.

• *Tornado Drills:*

Annual tornado drills should supplement fire drills to reinforce response behaviors. Drills were implemented after the 2013 Moore tornadoes and should continue (ODE, 2014).

• *Sheltering Education:*

Home sheltering in interior rooms is often the only option during rapid tornado onset. Community education on shelter-in-place basics like emergency kits, radio access, and helmets needs to be improved but vital.

• *Indigenous Inclusion:*

Preparedness messaging and training should engage Indigenous tribes and respect cultural needs. These groups suffer disproportionate disaster impacts (Lamb et al., 2020).

Table 5 outlines a proposed annual disaster education program for vulnerable Oklahoma City neighborhoods, including sample curriculum, partners, and formats.

Table 5 Proposed Annual Disaster Preparedness Education Program

Module	Content	Partners	Format
Risk awareness	Tornado science, historical impacts, forecasting	Schools, NGOs	In-person workshops
Warning systems	Siren use, text registration, interpreting alerts	Schools, media	Drills, video tutorials
Sheltering	Home preparation, radio use, kits	NGOs, clinics	Print materials, workshops
Medical	First aid, safety gear, accessing help	Clinics, NGOs	In-person training
Utilities	Off-grid capacity, generator safety, conservation	Energy, water companies	Radio PSAs, printed tips

➤ *Engaging Community Organizations*

Partnering with existing Oklahoma community organizations improves pre-disaster planning and preparedness through:

• *Cultural Competence:*

Groups like clinics, churches, and shelters rooted in minority communities build trust and tailor solutions.

• *Capacity Building:*

Training community partners propagates readiness. The CERT program trains volunteer groups in disaster skills (FEMA, 2022).

• *Vulnerable Inclusion:*

Partners like nursing homes, clinics, and social service groups ensure planning covers those most at-risk like disabled and low-income residents.

Table 6 outlines potential partner activities for different planning stages.

Table 6 Sample Community Partner Roles in Disaster Planning

Stage	Activities	Partners
Hazard analysis	Provide local data, convene workshops	NGOs, clinics, meteorologists
Vulnerability assessment	Identify at-risk groups, factors	Clinics, NGOs, community orgs
Education	Provide facilities, co-develop materials	Schools, shelters, places of worship
Early warning	Register residents, disseminate alerts	NGOs, media, telecoms
Evacuation	Map routes, identify shelters, assist mobility limited	Transport, schools, clinics
Response planning	Tailor plans to community, mobilize volunteers	All partners
Testing & evaluation	Support drills, provide feedback	All partners

Pre-disaster preparation and mitigation protects lives, property, and livelihoods while accelerating recovery in disaster-prone regions like Oklahoma. However, vulnerable populations often lack access to warnings, information, and planning capacity. Collaborative strategies to boost early alert systems, preparedness education, and community organization involvement can close these gaps. The localized, inclusive solutions proposed provide a model for strengthening resilience where it is needed.

**IV. UPGRADING MITIGATION THROUGH HOME AND INFRASTRUCTURE IMPROVEMENTS FOR ECONOMICALLY DEPRESSED COMMUNITIES IN OKLAHOMA**

Hazard mitigation reduces a disaster's impacts by limiting exposure and fortifying against damage. This protects lives, property, and livelihoods. Mitigation measures like drainage projects, building upgrades, and protective infrastructure strengthen community resilience (Smith, 2019). However, vulnerable populations often lack resources for major mitigation investments. Targeted funding, reinforcement initiatives, and inclusive planning can address this and build resilience where it is needed most.

This article examines upgrade strategies to bolster disaster mitigation in economically disadvantaged regions of Oklahoma. It focuses on infrastructure improvements, home reinforcements, and drainage projects.

➤ *Infrastructure Upgrade Funding*

Protective infrastructure like storm shelters, flood walls, and drainage systems mitigate disaster impacts. However, lower-income areas frequently need more resources to construct major protective works. Dedicated funding programs can close this gap. Potential options include:

• *Fema Mitigation Grants –*

Local governments and nonprofits can apply for programs like the Building Resilient Infrastructure and Communities (BRIC) grants which fund hazard mitigation projects protecting vulnerable communities (FEMA, 2022).

• *Storm Shelter Rebates –*

Subsidies and tax rebates could incentivize public, non-profit, and residential storm shelter construction in high-risk zones as seen in some Tornado Alley states (Simmons & Sutter, 2018).

• *Bond Measures –*

Ballot initiatives allow communities to vote for bonds financing infrastructure. Bond proceeds from property taxes spread costs widely. Tulsa’s flood mitigation bonds demonstrate success (City of Tulsa, 2021).

• *Private Partnerships –*

Partnerships with corporations and foundations allow mitigation funding for mutual benefit. Businesses relying on

surrounding communities may fund protective works to reduce losses from closures.

Table 7 shows potential mitigation projects to protect vulnerable Oklahoma communities alongside possible funding sources. A mix of local, state, federal and private support spreads resources.

Table 7 Potential Infrastructure Mitigation Projects and Funding Sources

Project	Funding Sources
Storm shelters	FEMA BRIC, shelter rebates, bonds, private partnerships
Flood walls, drainage	FEMA BRIC, bonds, private partnerships
Retrofitted public buildings	FEMA BRIC, bonds, private partnerships
Warning sirens	FEMA BRIC, bonds, local budget
Elevating flood-prone properties	FEMA BRIC, private partnerships

Strategic location of protective infrastructure maximizes community benefit based on exposure. Projects sited in lower-income areas improve equity in mitigation.

➤ *Home Reinforcement Initiatives*

Upgrading vulnerable residential buildings boosts mitigation but homeowners in disadvantaged communities often need help to afford major retrofits. Initiatives making home reinforcements affordable and accessible include:

• *Subsidies and Rebates –*

Direct financial assistance via subsidies or rebates defrays upgrade expenses for low-income homeowners. We are focused on the most at-risk.

• *Low-Cost Loans –*

Reduced interest loans make borrowing for upgrades affordable. Payback linked to energy savings could fund future works.

• *DIY Guidance –*

"How-to" resources empower low-cost DIY home hardening like securing roofs, windows and adding safe rooms. Provides accessible options.

• *Free Labor –*

Volunteer or nonprofit construction groups provide free installation labor for reinforcements, cutting costs. Habitat for Humanity models potential.

• *Low-Cost Supplies –*

Bulk purchasing and partnerships negotiate discounted reinforcement materials and safety supplies, reducing home prep costs.

Table 8 outlines potential home reinforcement initiatives tailored for vulnerable communities in Oklahoma. A mix of financial assistance, DIY capacity building, and subsidized access to labor/materials promotes affordability.

Table 8 Potential Home Reinforcement Initiatives for Vulnerable Oklahoma Communities

Initiative	Details
Subsidies for storm shelters	Up to 75% rebate for in-home shelters for low-income households
Reduced roofing loan rates	Low-interest loans to replace aging roofs with hurricane ties
DIY safe room guidance	Print and video guides on low-cost fortified safe rooms
Volunteer install event	Skilled volunteers provide free installs of window covers
Discounted safety supplies	Bulk purchase of discounted NOAA radios and emergency kits

Strategic location targeting using vulnerability indices ensures initiatives aid those most exposed and least able to independently mitigate homes.

➤ *Inclusive Drainage and Flood Control*

Flooding causes major damage in Oklahoma (NOAA, 2022). Drainage and control infrastructure reduces this but often overlooks marginalized communities. Inclusive planning boosts resilience by:

• *Hyperlocal Flood Mapping –*

Detailed topographical mapping highlights localized flood hotspots for targeted drainage fixes. Identifies overlooked areas.

• *Vulnerable Community Representation –*

Direct involvement of marginalized groups in planning ensures solutions reflect needs.

• *Land-Swap Incentives –*

Transfer developmental rights from high-risk properties to allow drainage or other protective works. Incentives fund relocation.

• *Natural Floodplain Restoration –*

Restoring wetlands and permeable surfaces allows natural absorption. Provides nature-based solutions.

Table 9 outlines sample strategies to improve inclusive flood control in a hypothetical vulnerable Oklahoma City

neighborhood. The mixed approach strengthens specific protections and broader capacity.

Table 9 Inclusive Flood Control Strategies for Sample Vulnerable Neighborhood

Strategy	Application
Hyperlocal mapping	Lidar survey of neighborhood flooding hotspots
Community representation	Flood control planning committee with local leaders
Land-swap incentives	Incentives to allow restoring floodplain wetlands
Natural restoration	Wetland restoration along creek flooding areas
Targeted drainage	New storm drains addressing mapped hotspots

An inclusive approach builds trust and identifies the hyper-local risks and needs specific to marginalized areas. The multiple benefits beyond direct flood reduction also boost general community resilience.

Mitigation protects lives and livelihoods while supporting faster recovery after disasters. Targeted infrastructure upgrades, home reinforcements, and inclusive planning for protective works strengthen preparedness where it is needed most. The strategies proposed empower vulnerable Oklahoma communities to feasibly maximize pre-disaster hazard mitigation through local knowledge and partnerships. Investing in resilience before disasters ultimately reduces the support required after.

➤ *Bolstering Emergency Response Capacity in Economically Depressed Communities in Oklahoma*

The critical emergency response phase immediately after a disaster provides lifesaving relief and stabilizes communities. However, vulnerable populations often face barriers accessing response services and support. Boosting local response capacity through expanded shelters, relief supplies, transportation access, and trained personnel builds resilience in marginalized areas.

This article examines strategies for bolstering emergency response in economically disadvantaged regions of Oklahoma prone to tornadoes, flooding, and winter storms. It focuses on expanding shelters and relief supplies, improving transportation access, and training relief workers.

Table 10 Sample Emergency Shelter and Relief Supply Expansion Plan

Strategy	Application
Multi-purpose shelters	Agreements to use schools, churches, centers
Modular shelter units	2 portable 80-person shelters based locally
Community supply caches	Caches at 2 schools, 1 church, 1 center
Mobile relief trucks	2 trucks with supplies and personnel

Strategic locations close to at-risk neighborhoods and pre-disaster coordination streamline deployments during chaotic emergency response stages.

➤ *Improving Transportation Access to Relief Services*

Reaching life-saving relief can be challenging for vulnerable groups lacking transportation options during disasters. Improving access through inclusive planning considers:

➤ *Expanding Emergency Shelters and Relief Supplies*

Emergency shelters provide safety and basic needs like food, water, and medical care during disasters. But shelter space and relief supplies frequently fall short in poorer communities (Jones et al., 2019). Potential expansions include:

- *Multi-Purpose Facilities:*  
 Agreements to quickly convert schools, churches, community centers into shelters maximize space. Still allows normal use.
- *Modular Shelters:*  
 Portable, modular units can provide scalable sheltering and relief capacity. Easily deployed to affected areas.
- *Decentralized Caches:*  
 Local caches of food, water, medical supplies at partner sites like schools enable neighborhood-level relief access.
- *Mobile Relief:*  
 Trucks with relief supplies and personnel deploy to affected neighborhoods to compensate for poor access. Brings support.

Table 10 shows sample shelter and relief supply expansion measures for a hypothetical vulnerable Oklahoma community. A decentralized, mobile-enhanced approach boosts coverage.

- *Localized Services:*  
 Distributed neighborhood-level aid reduces transit needs. Bringing support to people is efficient.
- *Transit Assistance:*  
 Providing public transit, ambulances, volunteer drivers transports people to shelters, supplies, medical care.
- *Accessible Design:*  
 Barrier-free facilities aid those with disabilities or limitations. Reduces evacuation and access issues.

- *Two-Way Information:*  
 Publicizing relief locations and transport options through multiple channels informs populations. Enables access.

Table 11 outlines sample strategies to boost inclusive access for a hypothetical vulnerable community in Oklahoma during emergency response.

Table 11 Strategies to Improve Relief Access for Vulnerable Community

Strategy	Application
Localized support	Mobile relief trucks visit 3 neighborhoods
Transit assistance	Buses on continuous loops between shelters and neighborhoods
Accessible shelters	Sites selected for wheelchair access
Two-way information	Shelter locations publicized via text alerts, radio, social media

Improving transportation access reduces capability barriers to life-saving services faced by marginalized communities during disasters.

- *Training Emergency Relief Personnel*  
 Responding effectively to the urgent needs of vulnerable communities requires personnel trained in:

- *Cultural Competence:*  
 Team diversity, awareness training, and local partnerships builds trust and communication.

- *Special Needs:*  
 Training to assist children, the elderly, disabled, non-English speakers, and pets.

- *Mental Health:*  
 Trauma training improves care for anxiety, grief, loss suffered in disasters. Supporting resilience.

- *Community Knowledge:*  
 Local awareness avoids assumptions about needs and capabilities. Boosts aid relevance.

Table 12 shows sample training modules for hypothetical responders assisting disadvantaged Oklahoma City neighborhoods amid tornado response.

Table 12 Sample Response Training for Vulnerable Community Context

Module	Topics
Cultural competence	Diversity awareness, cultural sensitivity, implicit bias
Special needs response	Disability assistance, vulnerable group protocols, pet care
Mental health support	Psychological first aid, coping strategies, stress reduction
Community knowledge	Local culture and needs primer; tips from community liaisons

Training focused on the specific context of diverse vulnerable communities makes response more effective. Periodic refreshers and exercises maintain readiness.

The urgent and complex response needs of vulnerable populations during disasters require planning and resources to boost local capabilities. Expanded, decentralized shelters and supplies, inclusive transportation access, and specialized personnel training strengthens capacity to save lives where it is needed most. Investing in bolstering frontline response resilience across all communities maximizes recovery for the entire region.

- *Advancing Recovery Planning and Economic Redevelopment for Economically Depressed Communities in Oklahoma*

The recovery period after major disasters struggles to effectively support vulnerable communities, as evidenced in outcomes from storms like Hurricane Katrina and Hurricane Maria (Johnson & Rainey, 2007; Kishore et al., 2018). Marginalized areas often face lengthy, uneven recoveries without adequate planning or resources. Targeted financial assistance, local hiring initiatives, and resilient rebuilding strategies can advance equitable recovery.

This article examines measures to improve recovery planning and spur economic redevelopment in disadvantaged regions of Oklahoma prone to tornadoes, flooding, and winter storms. It focuses on financial assistance programs, local hiring, and flood-resistant rebuilding.

- *Financial Assistance Programs*  
 Lack of insurance and savings leaves many vulnerable households financially devastated by disasters. Assistance programs help families and businesses restore housing, cover costs, and regain livelihoods during recovery. Potential expanded assistance includes:

- *Increased Aid Caps:*  
 Larger maximums for FEMA Individual Assistance accommodate higher repair costs. More flexibility aids underinsured homes.

- *Focused Outreach:*  
 Canvassing storm-damaged neighborhoods provides claims assistance to lower-income households who often miss support. Boosts equity.



• *Simplified Application:*

Streamlined, multilingual application options reduce barriers facing disadvantaged groups. Kiosks in affected areas expand access.

• *Traditional Knowledge:*

Consulting Indigenous tribes incorporates traditional construction knowledge into housing programs respecting culture (Phillips & Morrow, 2007).

Table 13 outlines sample financial assistance expansions to support equitable recovery in a hypothetical disadvantaged Oklahoma community.

Table 13 Sample Expanded Financial Assistance Program

Assistance	Details
Increased FEMA IA caps	Raise max household repair aid to \$50,000
Focused claims outreach	Door-to-door canvassing of damaged areas
Simplified application	Simplified form and multilingual options
Traditional knowledge	Consult tribal elders on culturally appropriate rebuilding

Prioritizing marginalized areas focuses resources where need is greatest during recovery.

➤ *Local Hiring and Procurement*

Recovery spending often leaks out of impacted communities, missing opportunities to economically rebuild. Local hiring and procurement initiatives retain benefits:

• *Local Labor Targets:*

Contracts mandate proportions of local hires for recovery construction jobs. Keeps wages in community.

• *Small Business Support:*

Prioritizing local small business contracting over outside firms circulates spending.

• *Skills Training:*

Free construction skills training allows displaced residents to qualify for rebuilding jobs. Provides opportunities.

• *Direct Cash Assistance:*

Providing unconditional cash aid to families boosts local spending and flexibility to address needs.

Table 14 shows potential local economic initiatives following a hypothetical tornado disaster in an Oklahoma community. The strategy aims to keep recovery dollars local.

Table 14 Sample Local Economic Initiatives for Tornado Recovery

Initiative	Details
Local labor targets	50% of contract hours worked by local hires
Small business contracts	30% of contracts awarded to local micro-businesses
Construction skills training	Free community training program placing graduates
Direct cash assistance	\$2000 to each affected household through recovery fund

Centering economic recovery on boosting disadvantaged residents and businesses rebuilds equitably.

➤ *Flood-Resistant Rebuilding*

Rebuilding damaged structures identically recreates vulnerability to future floods. Incorporating resilient designs protects families and assets. Strategies include:

• *Elevation Subsidies:*

Financial assistance for elevating chronically flooded homes above flood levels reduces repetitive impacts.

• *Zoning Updates:*

Prohibiting rebuilding of high-risk properties allows creation of wetlands or storm buffers instead.

• *Floodproofing Retrofits:*

Funds to waterproof foundations, install backflow valves, or raise mechanical systems makes homes more flood resilient.

• *Resilient Materials:*

The service of making mould/moisture resistant building supplies for low-income residents who rebuild it on their own improves the situation.

The following table contains rebuilding initiatives for flood resilience presented in Table 15, a sample flood resilience rebuilding initiative highlighting flooding in an Oklahoma community after a hypothetical flooding disaster.

Table 15 Sample Flood Resilience Rebuilding Initiatives

Initiative	Details
Elevation subsidies	Up to \$30,000 to elevate repetitive loss homes
High-risk zoning	Prohibit rebuilds on properties with >3 flood claims
Floodproofing retrofits	Subsidies for backflow valves, waterproofing, raised utilities
Resilient materials	Distribute free mold/moisture resistant drywall and flooring

Supporting the resilience practices protects rural families from the repeated cost burdens of recovery in recurrent flood disasters. Tailored financial support, disaster response and rebuilding resilience measures and regular investments in communities' economic wellbeing provide earnings that collectively constitute the finance needed to 'build forward' to a more inclusive place than where people were prior to the shocks. Oklahoma, like other regions hit with tornadoes flooding, and wintry weather, are threatening to marginal areas, but if responsive planning and initiatives work, redevelopment may come together with protection from the loss in the future.

➤ *Building Comprehensive Resilience in Economically Vulnerable Oklahoma Communities*

The multiple articles included in this series discussed approaches and formulations across disease management areas to strengthen resilience in impoverished areas of Oklahoma. Though targeted at tornado, winter storm, and flood susceptible regions of the state, the recommendations form a generic construct for the improvement in preparedness, response, recovery, and mitigation within disaffected communities in the United States.

The advice included measures to enlarge the early warning system, develop inclusive disaster education, boost surge shelter and relief supply capacity, focus the rebuilding process on resilience, and address the huggage in compensation. They wanted to simplify obstacles that are common among vulnerable groups that stand in the way of receiving necessary, life-saving information and resources. To this end, digital solutions tailored to suit the needs of local partners recognized the need to form partnerships in order to enhance the relevancy and embrace the power of hyperlocal.

In spite of these, the resilience is ultimately based on cooperative and well structured action across preparedness, response, recovery, and mitigation. The benefits from new early warning infrastructure are dependent on not only making the technology available, the technology must be paired with a community awareness campaign that makes residents prepared for disasters. Inclusive emergency sheltering is also generated by strong emergency sheltering, provides for little without transport access and trained professionals to facilitate their assistance.

Specifically, completing strategies that build a broader kind of resilience also relies on redressing the unfairness disparity of current procedures. This will work towards overcoming the differences since emphasis is set on providing financial help, mitigation investments, and localizing the service to undeveloped locations. Equitable resilience presents the opportunity for communities to be able to interdepend on each other with systems that are integrated while at the same time reducing the risks of communities where vulnerable people exist.

It is important for the stakeholders at the local, state, federal, private and not-for-profit levels to collaborate to ensure that complicated initiatives are implemented and joint working is coordinated in different fields. There is a need to

create partnerships among all agencies in Oklahoma, and this is mainly in emergency managers, community leaders, businesses, academia, faith groups, and all other likeminded stakeholders, where they work together towards the resilience problems. Planning with marginalized communities means that there is no already wrong assumption about needs but reflection is done.

No single project or funding stream can complete this immense task alone. But consistent, collaborative efforts over the long-term to enact policy reforms, invest equitably across neighborhoods, customize solutions to community contexts, and train inclusive workforces could lead Oklahoma towards a more resilient future for all, especially the most vulnerable. Just as disasters test social systems, the recovery process is also an opportunity to rebuild stronger and more just communities. Oklahoma has weathered many storms, but its greatest asset is its people. Together, a more resilient Oklahoma is within reach.

## V. CONCLUSION

The articles in this series examined strategies across the disaster management spectrum to strengthen resilience in economically disadvantaged regions of Oklahoma. While focused on tornado, winter storm, and flood-prone areas of the state, the recommendations also provide a model for enhancing preparedness, response, recovery, and mitigation in marginalized communities nationwide.

The recommendations spanned early warning system expansions, inclusive disaster education, surge shelter and relief supply capacity building, resilience-focused rebuilding, and financial assistance equity. They aimed to increase access to lifesaving information and resources by reducing common barriers faced by vulnerable groups. Locally-tailored, hyperlocal solutions leveraged partnerships to maximize relevance (Johnson & Rainey, 2007).

However, resilience ultimately depends on coordinated, integrated efforts across preparedness, response, recovery, and mitigation. Gains from upgraded early warning infrastructure require pairing with community education programs encouraging readiness. Robust emergency sheltering enables little without transport access and trained personnel to deliver assistance inclusively (Kishore et al., 2018).

Building comprehensive resilience also hinges on addressing equity gaps in existing policies and systems. Prioritizing marginalized areas for financial assistance, mitigation investments, and localization of services counteracts disparities. Equitable resilience allows communities to mutually support one another through integrated systems, rather than leaving vulnerable groups behind (Phillips & Morrow, 2007).

Collaboration among stakeholders at the local, state, federal, private, and nonprofit levels is vital to drive complex initiatives and coordinate across disciplines. Emergency managers, community leaders, businesses, academia, faith

groups, and all Oklahomans must work collectively towards resilience solutions. Engaging marginalized communities directly in planning avoids misguided assumptions about needs.

No single project or funding stream can complete this immense task alone. But consistent, collaborative efforts over the long-term to enact policy reforms, invest equitably across neighborhoods, customize solutions to community contexts, and train inclusive workforces could lead Oklahoma towards a more resilient future for all, especially the most vulnerable. Just as disasters test social systems, the recovery process is also an opportunity to rebuild stronger and more just communities. Oklahoma has weathered many storms, but its greatest asset is its people. Together, a more resilient Oklahoma is within reach.

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