

Academics to Practice: Student-Developed Innovative Solutions to Real Problems Through Partnership

Caroline S. Hackerott, PhD North Dakota State University

Carol L. Cwiak, JD, PhD North Dakota State University

Daniel R. Green FEMA Region 8



ABSTRACT

The Department of Landscape Architecture, Disaster Resilience, and Emergency Management (LADREM) at North Dakota State University (NDSU) partnered with the Federal Emergency Management Agency's Region VIII (FEMA R8) Office to develop an interdisciplinary capstone course to address complex problems experienced by practitioners in the Region. FEMA R8 identified specific work groups experiencing challenges and developed seven problem statements. LADREM faculty created an interdisciplinary course and recruited 28 advanced students to research and create potential solutions to each problem through problem-based and team-based pedagogies. Each student team included students from Landscape Architecture and Disaster Resilience and Emergency Management. Several teams included students from other majors including Sociology, Communications, Political Science, and Public Policy.

Each team worked with a unique problem that was "sponsored" by a FEMA R8 divisional office and had 1-2 FEMA R8 staff members serving as problem liaisons with their assigned team. Because the problems represented challenges specific to FEMA R8, problems focused on equitable approaches to providing support to rural and isolated communities within the region. NDSU faculty provided academic support and pedagogical guidance as students conducted interviews with professionals and impacted community members. Using a process of problem contextualization, ideation, war-gaming, and recommendation; students created empirically supported recommendations for addressing each problem. Recommendations included policy feedback, practical tools, and suggested strategies for equity and inclusion. Student recommendations were presented to problem sponsors and other FEMA and university officers at the conclusion of the course.

PARTNERSHIP: FEMA Region 8 and NDSU Department of Landscape Architecture, Disaster Resilience, and Emergency Management

FEMA Region 8

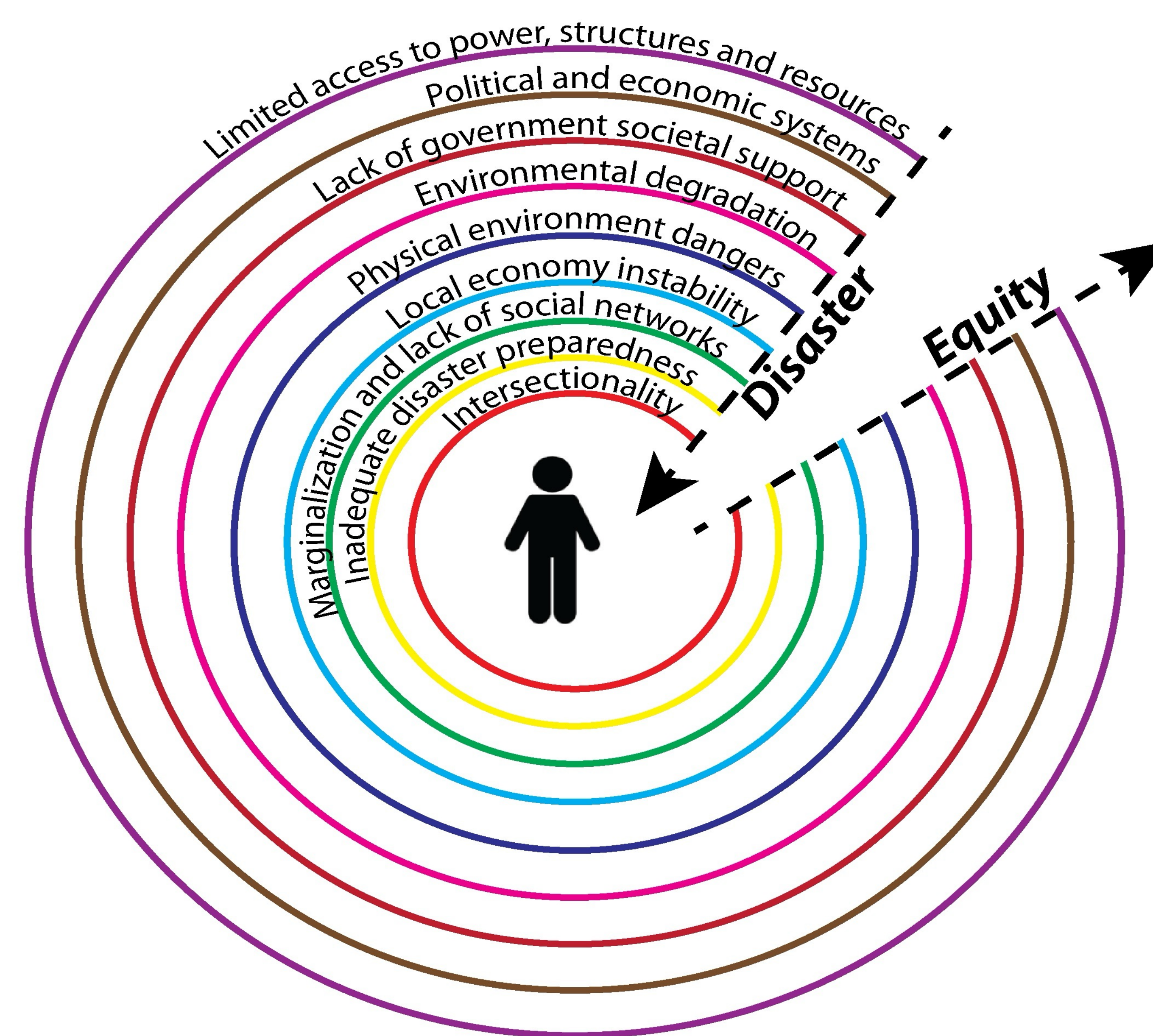
NDSU Department of Landscape Architecture, Disaster Resilience, and Emergency Management

- Developed Problem Statements
- Identified Problem Sponsors:
 - Commitment to Student Teams: Monthly Meetings, Problem Clarification, Solution Feasibility
- Invested in Solutions/Products
- Curated Initial List of Subject Matter Experts
- Continuous Feedback with Course Instructors

- Course Design and Delivery
- Institutional Infrastructure
- Student Recruitment
- Student Support
- Progress Assessment
- Solution/Product Creation
- Presentation and Reports

PROBLEM STATEMENTS AND SOLUTIONS/PRODUCTS

1. FEMA Continuous Improvement Programs need a framework for conducting simultaneous and collaborative disaster assessment in a multiagency setting in order to create a community of practice among federal change agents.
 - Proposed process based on ESF structure to facilitate communication and information depository to create transparent and collaborative AARs across multiple federal, state, and local agencies.
2. FEMA Region 8 needs a way to evaluate the best uses of publicly available datasets to understand the delivery of federal programmatic assistance in order to evaluate its effectiveness in supporting historically underserved communities.
 - Created a new framework for identifying the underserved within each community after determining existing databases were not sufficient for rural and isolated communities using the model of local culture brokers and multiple theories of social vulnerability.
3. FEMA needs additional ways to better incorporate tribal, state, and local knowledge from North Dakota to fully integrate lived experiences and human-centric design into hazard mitigation.
 - Proposed a grant initiative to fund community-based planning specialists for rural communities.
4. FEMA Region 8 wants to better understand how local policy might affect disaster recovery costs in order to share best practices for pre-disaster recovery planning with communities in Region 8.
 - Provided multiple recommendations focused on capacity and capability development centered on addressing the gap in local investment in holistic emergency management that would result in reduced recovery expenditures.
5. FEMA Region 8 needs a way to bolster the administrative capabilities of rural communities to make them more competitive and capable in their pursuit of federal funding that could build resilience and mitigate against local hazards.
 - Identified low levels of local emergency management capability and capacity as the dynamic most influential in limiting rural communities in pursuing federal funding. Recommended specific strategies for increasing both emergency management capacity and capability through targeted funding, educational, and support initiatives in rural areas.
6. Emergency managers need a means to communicate with rural populations without adequate traditional media, cellular, or broadband coverage to ensure these populations are aware of and can participate in disaster response, recovery, and preparedness activities.
 - Provided multiple recommendations targeted on developing communication depth and effectiveness in rural by leveraging existing initiatives, resources, and partnerships creatively.
7. FEMA Region 8 needs to develop a unified approach for local state, tribal, and federal emergency managers to jointly utilize during disasters in order to effectively and efficiently provide disaster assistance to affected areas and persons.
 - Created a guidebook that supports capability development in both disaster and non-disaster periods to fill a gap in rural emergency management due to insufficient support to meet the responsibilities of the emergency manager position.



Niedzielski, Budhathoki, & Ctine; 2024

PEDAGOGY AND INSTRUCTIONAL DESIGN

- Interdisciplinary
- Modified Team-Based Learning Model featuring collaborative small teams (Michaelsen et al., 2004)
- Problem-Based Education approach with maintained relationship with problem sponsors invested in final products/outcomes (Fink, 2013; Morris, 2019)
- Self-directed learning (Brookfield, 2009; Mncube & Maphalala, 2023)
- Capstone level structure (seniors and graduate students)
 - DREM students provide foundational disaster resilience and emergency management knowledge to support other disciplinary majors
- Project management
 - Multiple due dates
 - Scaffolding
 - Individual activities to support team progress
- Instructional coaching
- Direct and regular interaction with problem sponsors
- Continuous collaboration between faculty and FEMA Problem Administrator to guide process and outcomes
- Reports and Presentations
 - Audience
 - Manage partner expectations
- Assessment
 - Self-evaluation
 - Peer evaluation
 - Problem Sponsor evaluation
 - Faculty evaluation

ACADEMIC LEARNING OUTCOMES

(As Identified through Student and Problem Sponsor Assessment)

Application of Previous Experience and Knowledge	Research Skills	Complex Collaboration
Project Management	Context of Real World Wicked Problems	Solution Feasibility Testing
Development of Professional Network	Publication of Reports	Creative Problem Solving
Professional Public Speaking		



For access to all completed reports, please use this QR code. All reports are available for download.

Course Model Available by request

The development and evaluation of this model course is supported, in part, by a FEMA Higher Education Program Research Award.

