Pilot Study and Workshop for Enhancing Rural-to-Urban Disaster Resilience by Integrating Social, Spatial and Digital Networks

NSF # 1952206

Hyung Jin Kim, PhD, Kansas State University

(SCC-PG, FY2020)

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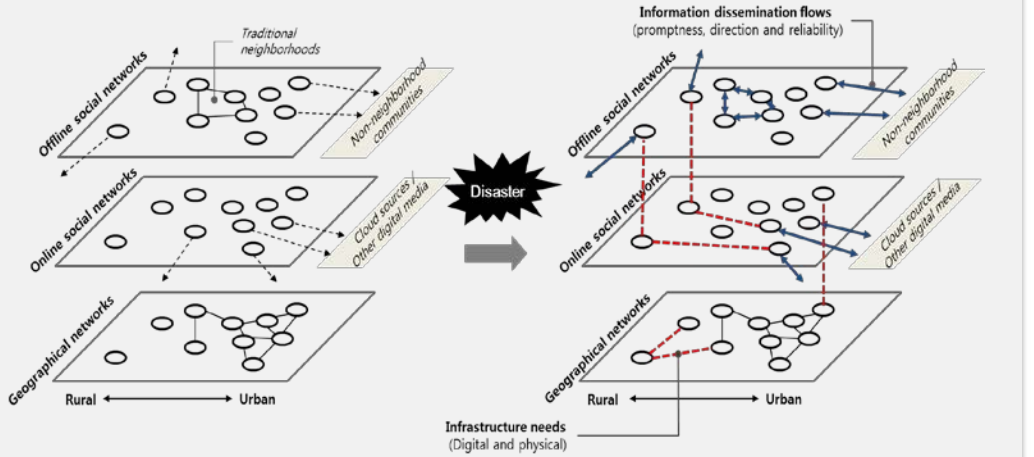
Project Overview

Visual Schematic

Pilot Study: An investigation into multi-layer social networking patterns in disaster situations overlaying social, geographical and digital networks.



Multi-state Community Surveys and Workshop

Project Vision

- To identify barriers and enablers for composability of online and offline social networks bound to a geographical area.
- To understand, and model as a stochastic hybrid system (SHS) on a graph, the interactions between multiple networks and the disaster-related impact on individuals.
- To help increase the robustness of online and physical infrastructure systems for disaster resilience across a wide range of community structures.

Project Overview

Use-Inspired Research

- To identify barriers and enablers for effective communication of vital time-critical information, and for the filtering of disinformation, over online and offline social networks in disaster situations.
- Benefits for the current and projected vulnerable population in high-risk Midwest watershed areas, frequently affected by flooding:
  - Targets: urban, suburban and rural residents from Riley County, KS Buchanan County, MO; and Platte County, NE.

PG Activities

- Conducting an interdisciplinary pilot study for understanding the information flow in pre- and post-disasters towards the desired future infrastructure models that will inform optimal community planning and investment.
- Organizing a multi-state community-engaged workshop to share the research findings and understand the infrastructure needs and robustness of the augmented social networking, especially for digitally or geographically disconnected communities.

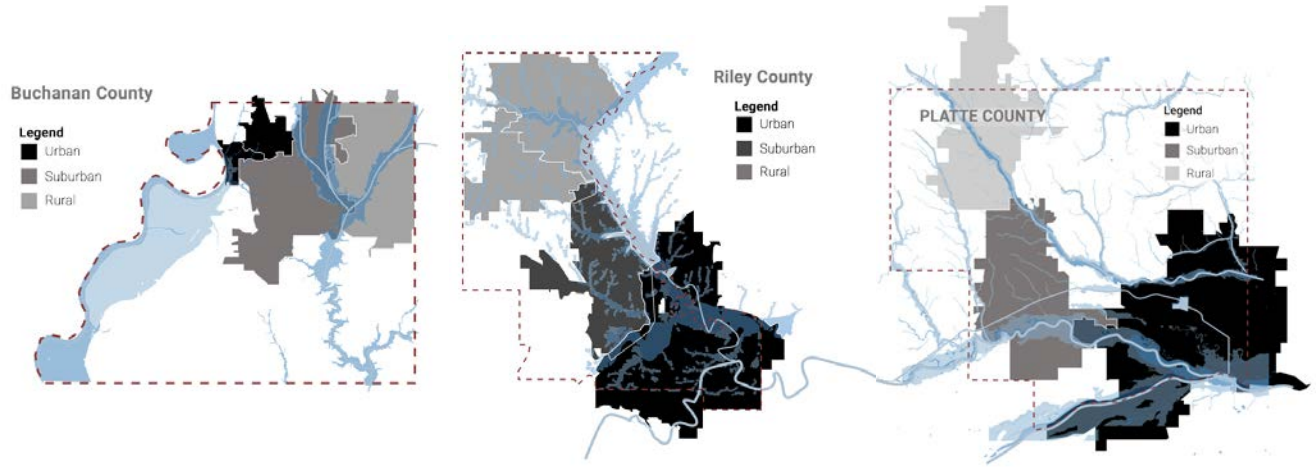
Project Update

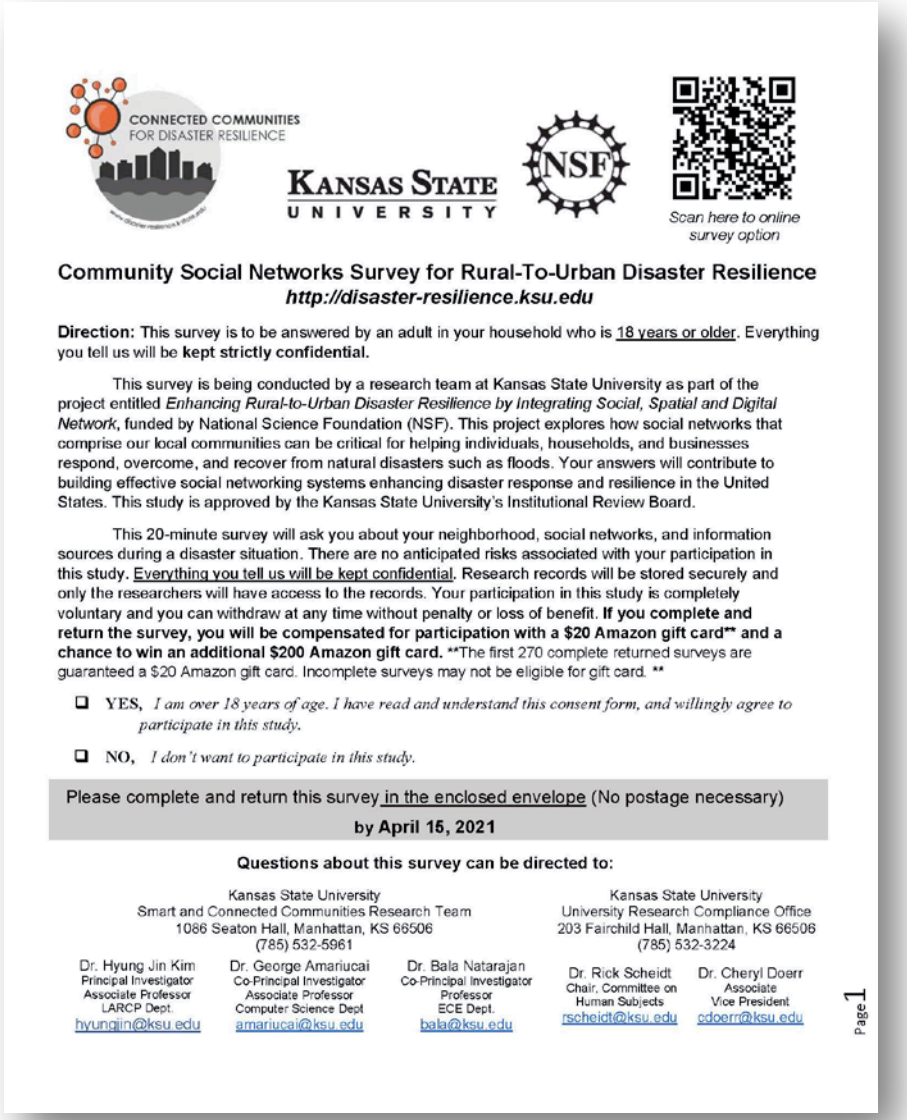
Activities to Date

- **Data collection**
  - **Community Social Networks Survey for Disaster Resilience (March-April, 2021):**

    Total 2,736 samples using stratified cluster sampling from urban, suburban and rural residents within Riley County (KS), Buchanan County (MO), and Platte County (NE), situated in flood zones.

- **Project website (disaster-resilience.ksu.edu) launched for feedback and team building**





CONNECTED COMMUNITIES FOR DISASTER RESILIENCE

KANSAS STATE UNIVERSITY

NSF

Scan here to online survey option

Community Social Networks Survey for Rural-To-Urban Disaster Resilience
http://disaster-resilience.ksu.edu

Direction: This survey is to be answered by an adult in your household who is 18 years or older. Everything you tell us will be **kept strictly confidential.**

This survey is being conducted by a research team at Kansas State University as part of the project entitled *Enhancing Rural-to-Urban Disaster Resilience by Integrating Social, Spatial and Digital Network*, funded by National Science Foundation (NSF). This project explores how social networks that comprise our local communities can be critical for helping individuals, households, and businesses respond, overcome, and recover from natural disasters such as floods. Your answers will contribute to building effective social networking systems enhancing disaster response and resilience in the United States. This study is approved by the Kansas State University's Institutional Review Board.

This 20-minute survey will ask you about your neighborhood, social networks, and information sources during a disaster situation. There are no anticipated risks associated with your participation in this study. Everything you tell us will be kept confidential. Research records will be stored securely and only the researchers will have access to the records. Your participation in this study is completely voluntary and you can withdraw at any time without penalty or loss of benefit. **If you complete and return the survey, you will be compensated for participation with a $20 Amazon gift card** and a chance to win an additional $200 Amazon gift card.** **The first 270 complete returned surveys are guaranteed a $20 Amazon gift card. Incomplete surveys may not be eligible for gift card. **

☐ **YES,** *I am over 18 years of age. I have read and understand this consent form, and willingly agree to participate in this study.*

☐ **NO,** *I don't want to participate in this study.*

Please complete and return this survey in the enclosed envelope (No postage necessary)
by April 15, 2021

Questions about this survey can be directed to:

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Project Evolution

How have planning grant activities shaped or evolved the long-term vision of the project? Specifically, we want to understand how engagement with your team (e.g., researchers and community partners) and feedback from the target community is informing your vision for the future IRG project. Give one or two specific examples.

This project is still in the data collection stage but aims to share the research findings with community members and stakeholders through project website and multi-state community workshops this year. We will also collect feedback and opinions from community stakeholders through workshop in order to understand their infrastructure gaps and needs of augmented social networking for digitally and geographically disconnected communities.

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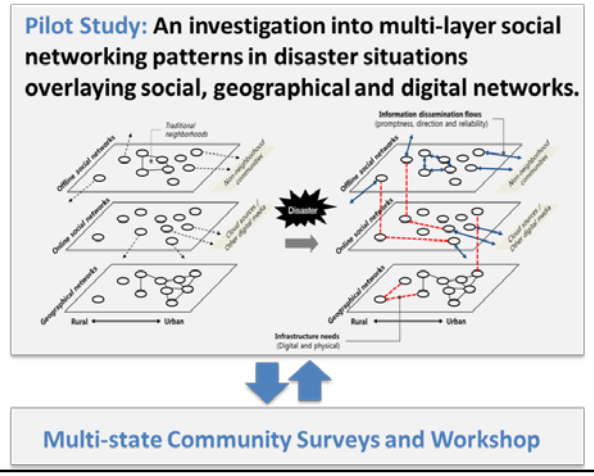
Visual Schematic



Project Vision

- To demonstrate robust insights into how a geographical approach to online social network models by identifying barriers and enablers for composability of online and offline social networks.
- To understand, and model as a stochastic hybrid system (SHS) on a graph, the interactions between multiple networks and the disaster-related impact on individuals.
- To help increase the robustness of online and physical infrastructure systems for disaster resilience across a wide range of community structures.

Use-Inspired Research

- To identify barriers and enablers for composability of online and offline social networks in disaster situations.
- Anticipated benefits for the current and projected vulnerable population in high-risk Midwest watershed areas, which have been frequently affected by flooding:

  Target communities: urban, suburban and rural residents from Riley County, Kansas; Buchanan County, Missouri; and Platte County, Nebraska.

PG Activities

- **Conducting an interdisciplinary pilot study** that investigates the multi-layer social networking patterns for information dissemination in disaster situations by overlaying social, geographical and digital networks.
- **Organizing a multi-state community-engaged workshop** to share the research findings and understand the infrastructure needs and robustness of the augmented social networking, especially for digitally or geographically disconnected communities.