Goals of this Project

Network Resilience Conference

Outcomes

Funding opportunities and collaborations

Future…
Network Resilience in Disasters: An Interdisciplinary, International Perspective

Satish Ukkusuri, School of Civil Engineering
Joint work with Prof. Daniel Aldrich, Department of Political Science

GPRI Seminar
Introduction
Goals

- Develop a theoretical framework for network resilience from a multidisciplinary perspective

- Create foundations for ongoing and future interdisciplinary, global collaborations (NSF, NOAA and DHS)

- Strengthen Purdue’s capacity in disaster science/engineering and collaborations with institutions in India, Japan and Europe.
Task Outline

- Problem conceptualization
- Preliminary framework for disaster resilience
- Develop specific hypotheses and modeling frameworks
- Organize an international workshop
- Publish journal and conference articles and apply for funding opportunities
Preliminary Funding Opportunities

- New NSF grants
- NOAA funding on Hazard Resilient Communities
- DOH grants on building resilient communities
- World Bank Funding
International collaborations

- Tata Institute of Social Sciences, Mumbai, India – Dr. Janki Andharia
- Delft University of Technology, The Netherlands – Dr. Michiel Bliemer
- University of Tokyo, Japan – Dr. Yasuyuki Sawada

One of the first interdisciplinary research efforts bridging knowledge between engineering and social science work on disaster recovery
Resilience Conference on April 7 2011

- Covered by media.
- 60-70 attendees from academia, agencies and industry
- AM: Closed door session with various experts from social science, engineering, economics, management and policy
- PM: Open Session. Divided into invited talks, social science panel and engineering panel
- Speakers: Brigadier General Margaret Washburn; Professors Shigeo Tatsuki and Janki Andharia
Resilience Conference

- Panel discussions focused on:
  - the definition of network resilience,
  - performance metrics to measure network resilience,
  - experience with real world disasters,
  - role of infrastructure and social systems in aiding resilience,
  - the emerging issues in various disciplines on this topic
  - linkages across these different disciplines
- Summary of this discussion was transcribed by two graduate students
- PCCRC greatly assisted with organizing the conference
Collect Data from Rural Communities in Gulf Coast (Hurricane Katrina) and rural Tamil Nadu, India (Indian Ocean Tsunami)

**SOCIAL CAPITAL**
Factors influencing social capital – bonding, bridging and linking
- Strength of Communities Ties
- Presence/Absence of “social relays” and community leaders
- Rate of recovery with time based on population return/voter turnout

**INFRASTRUCTURE**
Transportation, Water, Communication, Energy
Factors influencing transportation recovery – safety, accessibility, infrastructure condition
Influence of Social Capital on Recovery and Mechanisms to Accelerate Resilience

Develop Specific Actionable Policies Accounting for a Holistic Perspective of Rural Community Resilience
Outcomes

- Creation of report summarizing the discussion of various scholars on network resilience

- Established collaborative opportunities between various scholars

- Involved Purdue graduate students in various aspects of the conference
### Outcomes

- One journal publication by Prof. Ukkusuri and one publication by Prof. Aldrich are forthcoming in peer-reviewed journals.

- Ukkusuri and Aldrich submitted a joint NSF grant to the Disaster Resilience in Rural Communities solicitation.

- Ukkusuri and Aldrich submitted a 3-year, $300,000 Center for Global partnership grant. International collaboration with Japan to collect recovery data about the Tohoku disaster.
Future...

- Ukkusuri and Aldrich to continue to write joint proposals to NSF, USAID, NOAA and other private foundations

- Ukkusuri and Aldrich to develop joint publications on network recovery

- We have identified different stakeholders at Purdue and beyond who are interested in this topic (e.g. PCCRC, Homeland Security Institute, GPRI). Position Purdue as a leader in the interdisciplinary area of disaster management.