

# Facing Hazards and Disasters: Understanding Human Dimensions

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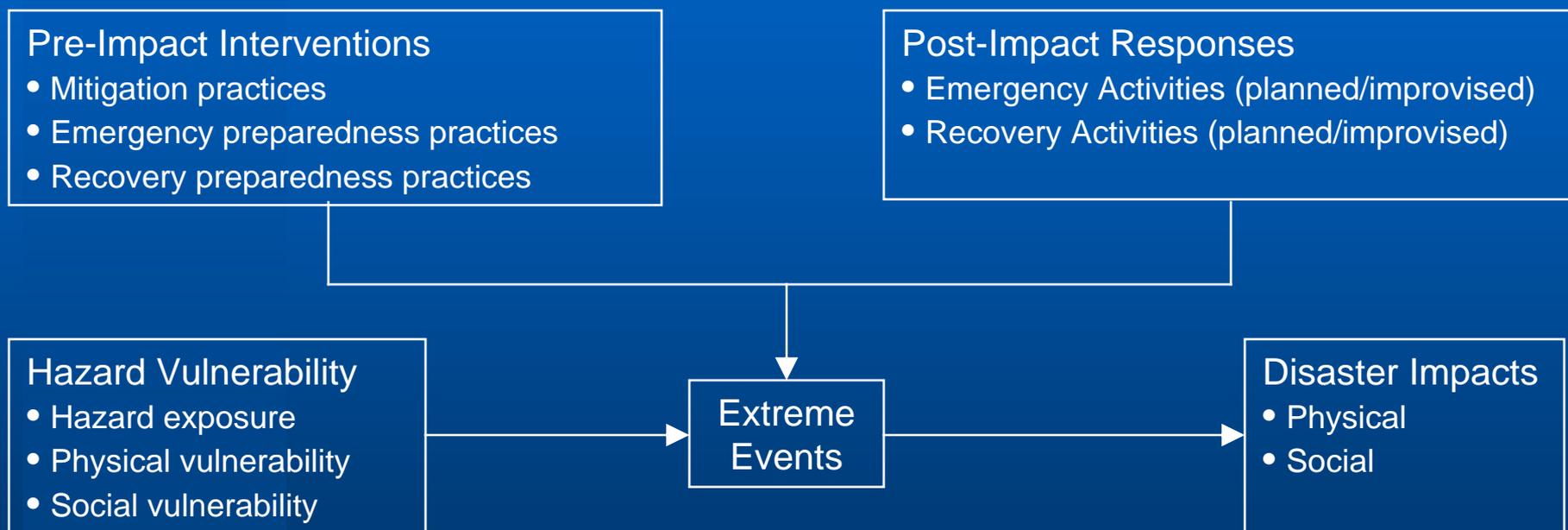
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# A Simplified Model of the Hazards and Disaster Management System



For a more complete discussion of this model, see Lindell, M.K., Prater, C.S. & Perry, R.W. (2006). *Fundamentals of Emergency Management*. Emmitsburg MD: Federal Emergency Management Agency Emergency Management Institute. Available at [www.training.fema.gov/EMIWeb/edu/fem.asp](http://www.training.fema.gov/EMIWeb/edu/fem.asp).

# Hazard Vulnerability

- Hazard exposure
  - Probability that an event of a given physical magnitude and scope will occur in a given location
- Physical (structural) vulnerability
  - Probability that an event of a given magnitude will cause various damage states
- Social vulnerability
  - Probability that identifiable persons or groups will lack the capacity to anticipate, cope with, resist, and recover from the hazard impacts

# Disaster Impacts

- Physical impacts
  - Casualties: Deaths and injuries
  - Damage: Buildings, lifelines, and vehicles
- Social impacts
  - Psychological: Cognitive (beliefs about hazards and hazard adjustments) and affective (emotional reactions)
  - Demographic: Emigration from and immigration to the impact area
  - Economic: Direct and indirect losses to households, businesses, and governments
  - Political: Attribution of blame for impacts and allocation of community resources for response and recovery

# Hazard Mitigation Practices

- Hazard source control
  - Interventions that control hazard generation
- Community protection works
  - Interventions that protect specific geographical areas
- Land use practices
  - Interventions that limit development in hazard prone areas
- Building construction practices
  - Interventions that reduce the vulnerability of structures and infrastructure
- Contents protection practices
  - Interventions that reduce the vulnerability of building contents

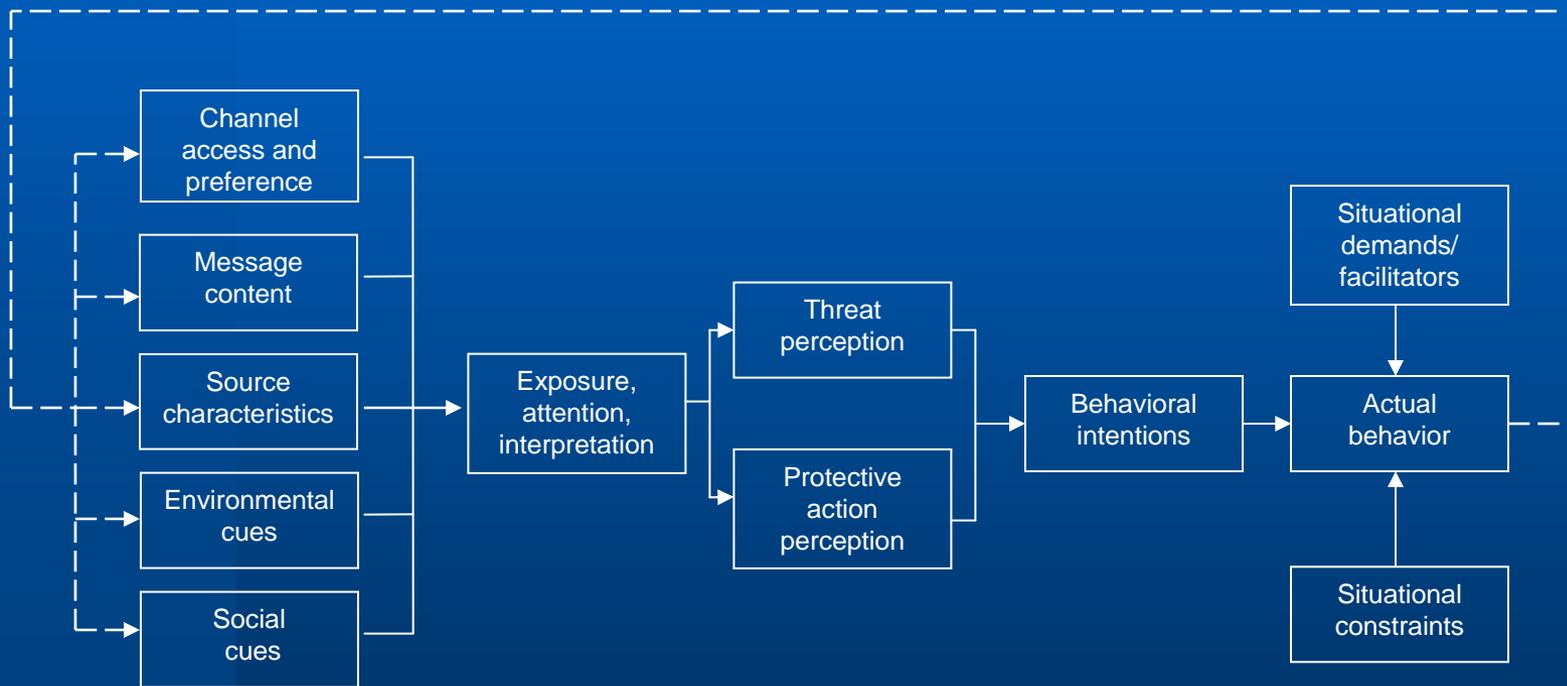
# Response Preparedness Practices

- Planning processes that develop the capacity to perform fundamental emergency response functions
  - Emergency assessment
  - Hazard operations
  - Population protection
  - Incident management
- Training and equipping activities
- Drills, exercises, and incident critiques

# Recovery Preparedness Practices

- Planning processes that develop the capacity to perform fundamental recovery functions
  - Damage assessment
  - Debris removal
  - Infrastructure restoration
  - Housing recovery
  - Economic recovery
  - Psychological recovery
  - Political recovery

# Household Hazard Adjustment Adoption



# Research Recommendations

- Refine the concepts and methods involved in hazard vulnerability analysis.
  - Hazard exposure, physical vulnerability and--especially--social vulnerability
- Examine the dynamics of hazard vulnerability and identify better interventions for addressing this problem.
- Assess the effectiveness of existing programs for hazard mitigation and emergency preparedness (including risk communication).
- Develop better models of the adoption of mitigation and preparedness measures--including hazard insurance purchase.
  - Incentives, sanctions, and risk communication

# Research Recommendations

- Develop better models to guide decisions about hazard operations and protective actions in emergencies.
- Assess the extent to which hazards/disaster research findings are being implemented in local emergency operations plans, procedures, and training.
- Examine the effectiveness of procedures for conducting training, exercises, and critiques.
- Identify the factors that promote the adoption of more effective disaster recovery preparedness programs.