World Bank Group Report Launch: Financial Protection of Critical Infrastructure Services

IGNITE PRESENTATIONS
Singapore Disaster REsilience Assessment, Modelling, and INnovation (DREAMIN’) project

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Goal: To develop a **predictive tool of resilience** using system modelling and Machine Learning (ML)

Overview of methods:

- Scenario structuring:
  - Disruption inputs
  - Recovery inputs
  - Network model

- System simulation:
  - Power
  - Water
  - Transport

- Resilience assessment:
  - System performance

- Interpretable ML:
  - Interpretable ML

- Design & Innovation:
  - Modular Design
  - Adaptable Design
  - Design for Extremes
  - PESTLE

Expected outcomes:

1. **Simulation platform for the interdependent infrastructure**
   - to be used to evaluate infrastructure risks and test recovery strategies

2. **Resilience prediction and analysis model**
   - to be used to predict the resilience output given scenario inputs

3. **Novel system concepts**
   - including solution directions to increase and maintain resilience
**Future research:** To develop a framework and associated tools to quantify the **indirect economic losses due to infrastructure disruptions**

**NEXT STEPS**

- **Power Grid**
- **Water Distribution System**
- **Transport Network**

**A recent example**

- Power outages, water shortages as Texas shivers
- ‘Emergency’: How a winter storm and power outages plunged Texas into crisis
- Texas winter storm blackouts hit chip production

Figure courtesy of Hans R Heinimann