US-Taiwan Workshop on Mega City/ Mega Disaster (MCMD) Mitigation

Position Paper

George. C. Lee
University at Buffalo

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Key points of Position Paper

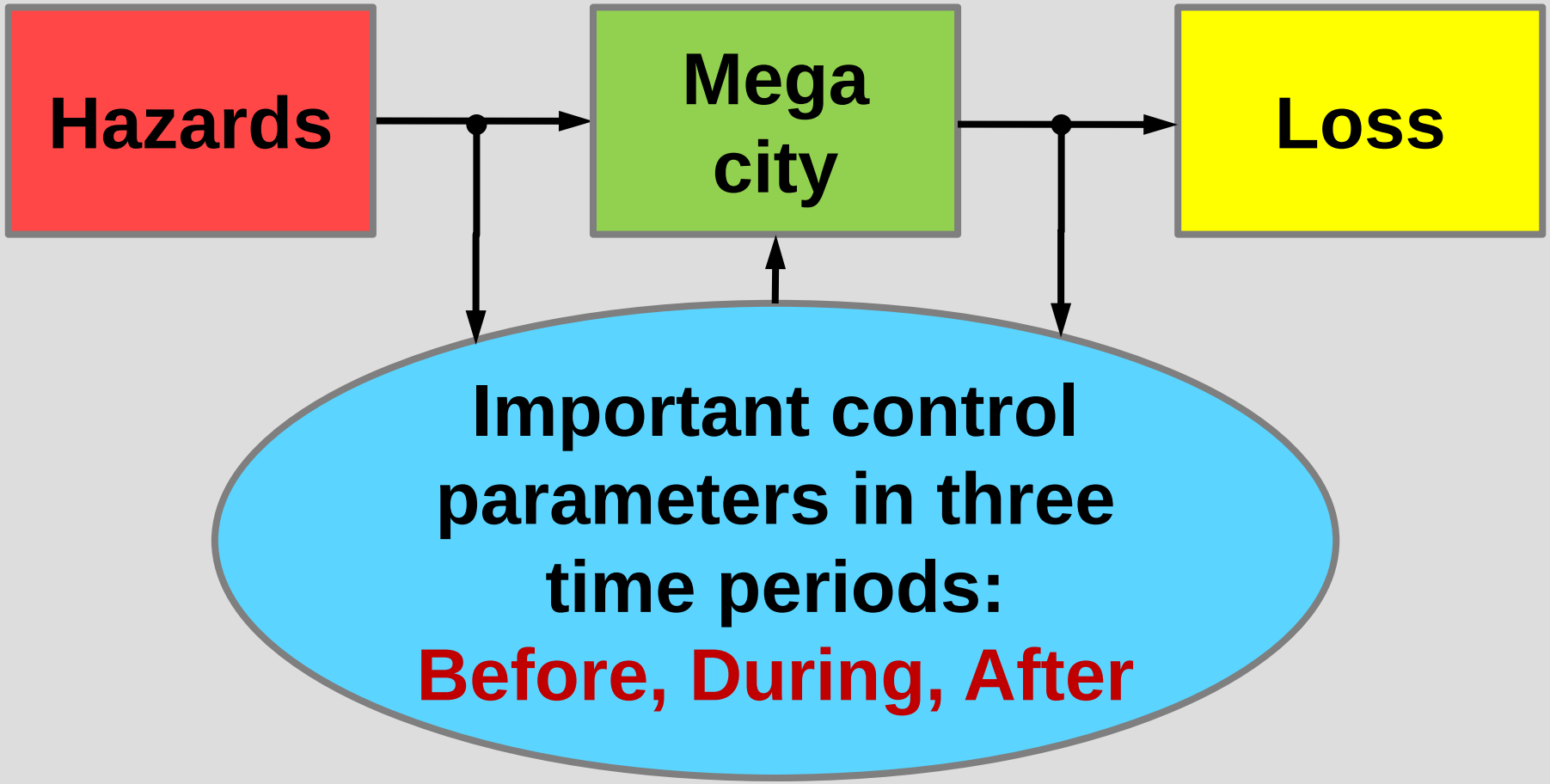
- Issues and their interactive natures are too complex to consider in a 2-day workshop, particularly for objectives 1 and 3.
- Identify only few major knowledge gaps from a global perspective and address them by follow up workshop series systematically.

The global view

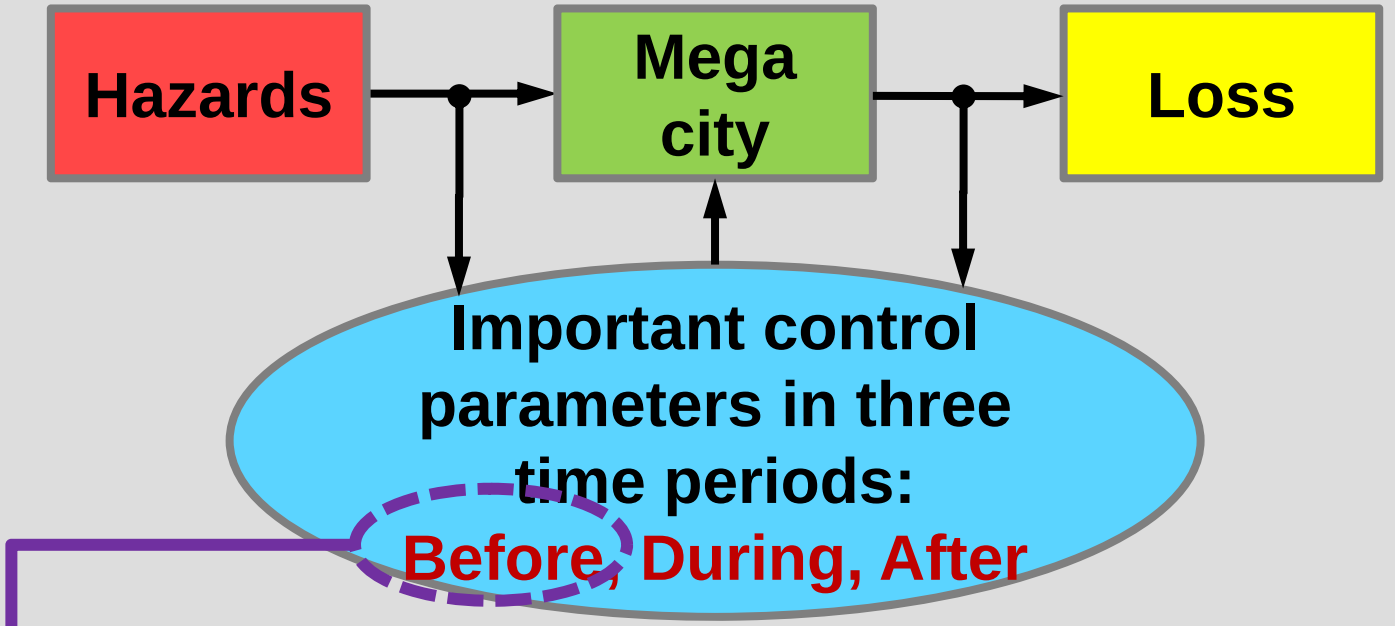
The input-output system:

The challenge: Reduce the losses!

Loss Reduction

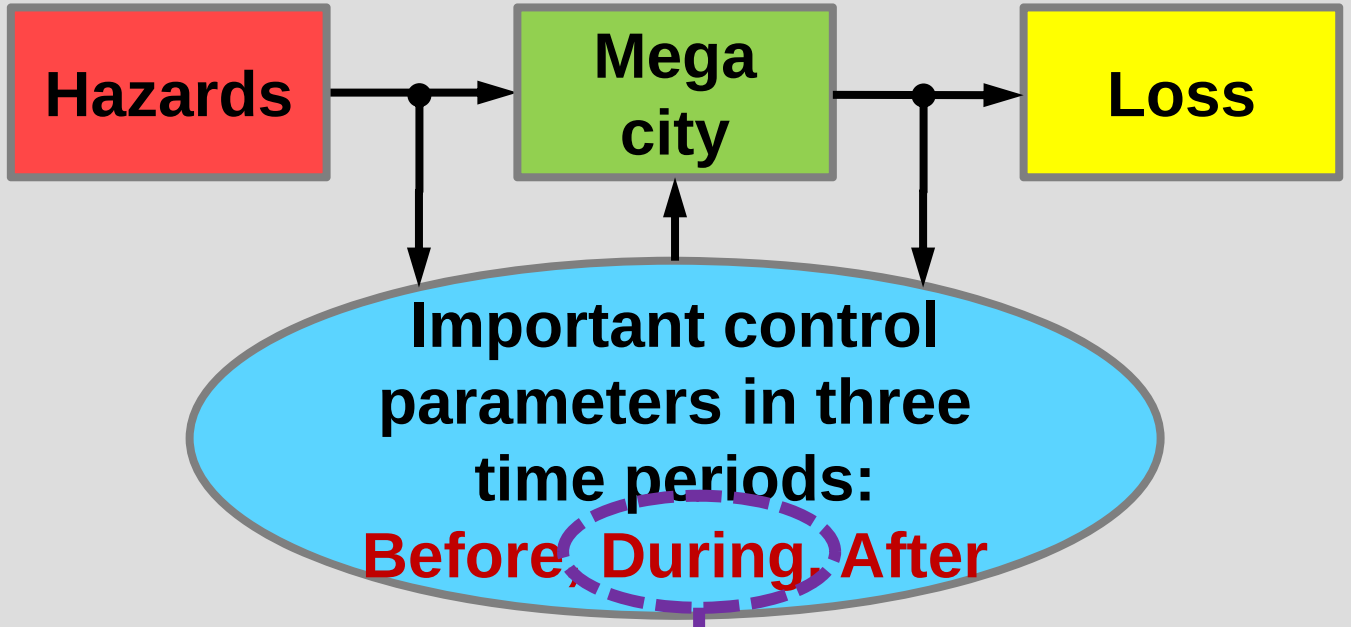


Loss Reduction



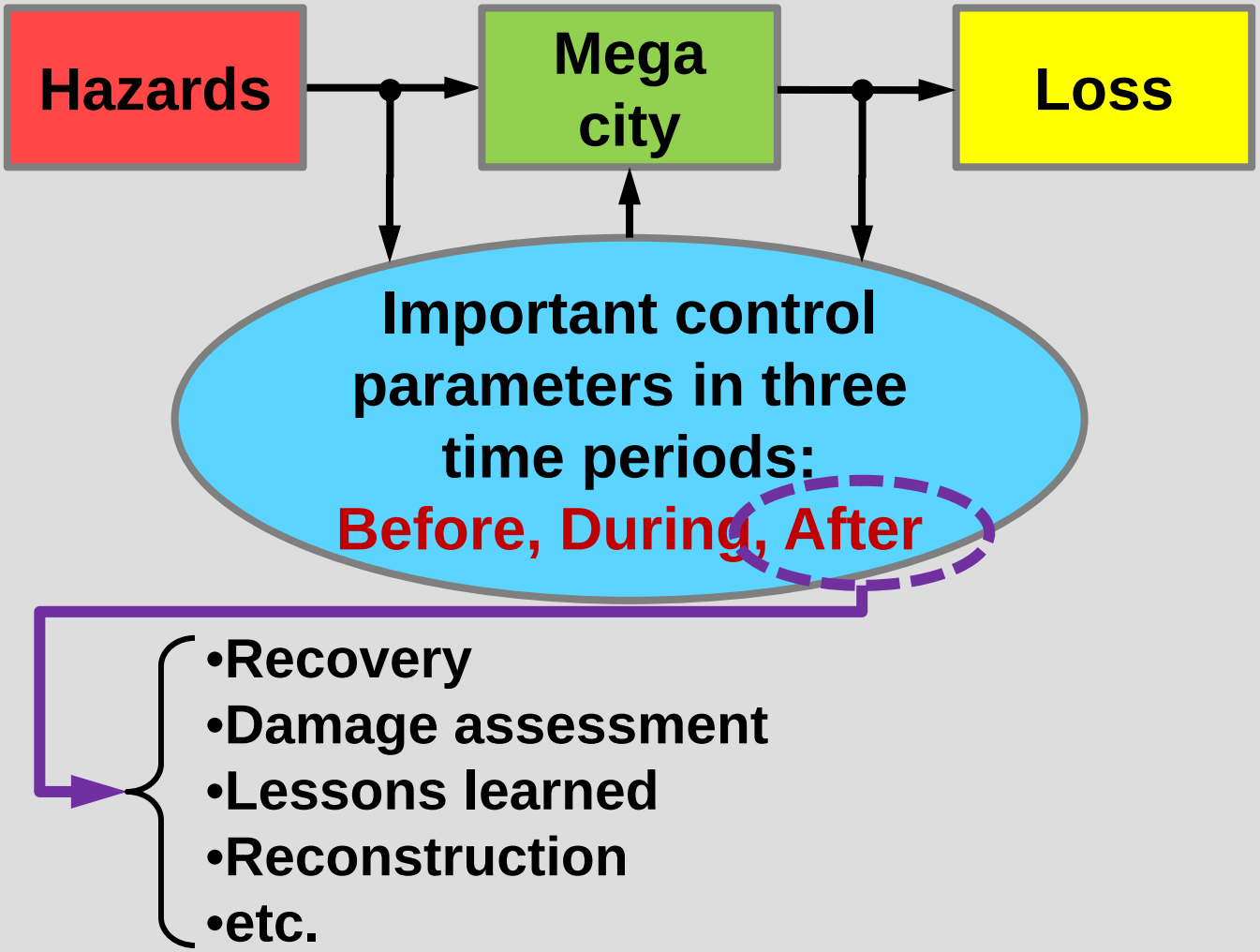
- Hazard modifications, if possible
- Physical systems vulnerability modifications
- Education and training of the public
- Information systems readiness
- etc.

Loss Reduction

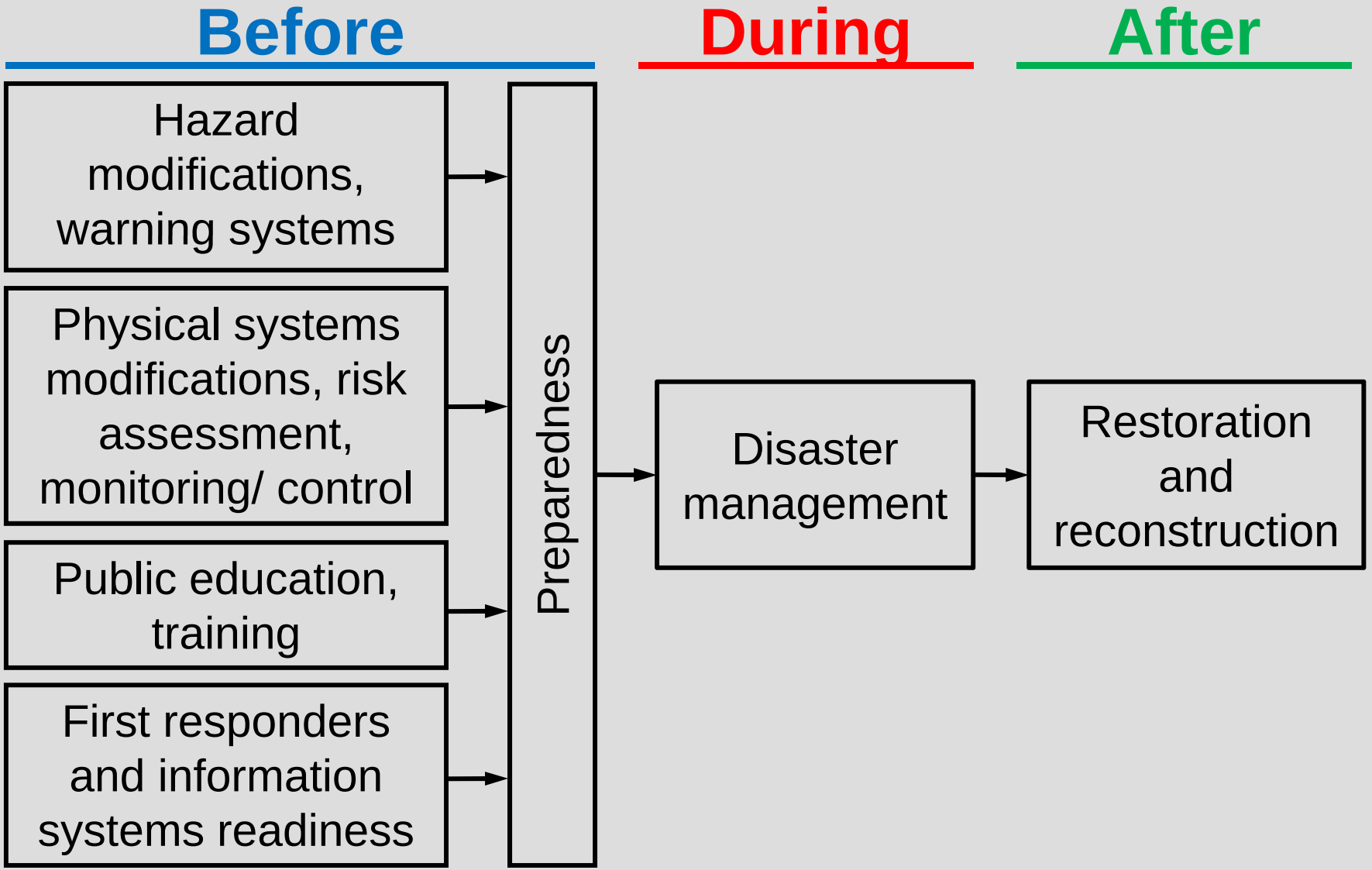


- Command/ Control systems
- Communication systems
- Search/ Rescue systems
- Life support and other emergency response systems
- etc.

Loss Reduction



Loss Reduction



Working Group 3

Assessment technologies to quantity the risk posed to individual infrastructure and systems of infrastructures.

- **A small aspect in the "preparedness" landscape**
- **Need to define objectives (and acceptable levels) of loss reduction**
- **Integration/coordination with other working groups**

Working Group 3

Recommendation from the engineering perspective.

Define a few important issues from the objectives:

1.New knowledge for MCMD mitigation

- Forecasting natural disaster frequency and intensity
- Increase infrastructure resilience
- Risk assessment of infrastructure systems
- Emergency response and recovery

2.Strategic measures for effective disaster response

- Land use policy
- Social/ economic factors

3.Multi-disciplining education program

Working Group 3

Some challenges in assessment technologies from the engineering perspective.

Important engineering knowledge gaps invisible in the workshop objectives:

- **Quantify extreme hazard performance of physical infrastructure systems (of different components)**
- **Quantify the probability density function of extreme hazard events to establish acceptable risk**
- **Quantify cascading effects on physical infrastructure systems (of different components) due to concurrent or consequential of extreme hazards**

Working Group 3

Some challenges in assessment technologies from the engineering perspective.

Formulate a future workshop including the above engineering aspects and the following knowledge areas:

- **Multi-scale modeling**
- **Multi-disciplinary contributions**
- **Mitigation for emergency responses**
- **etc**

Thank You!

gclee@buffalo.edu