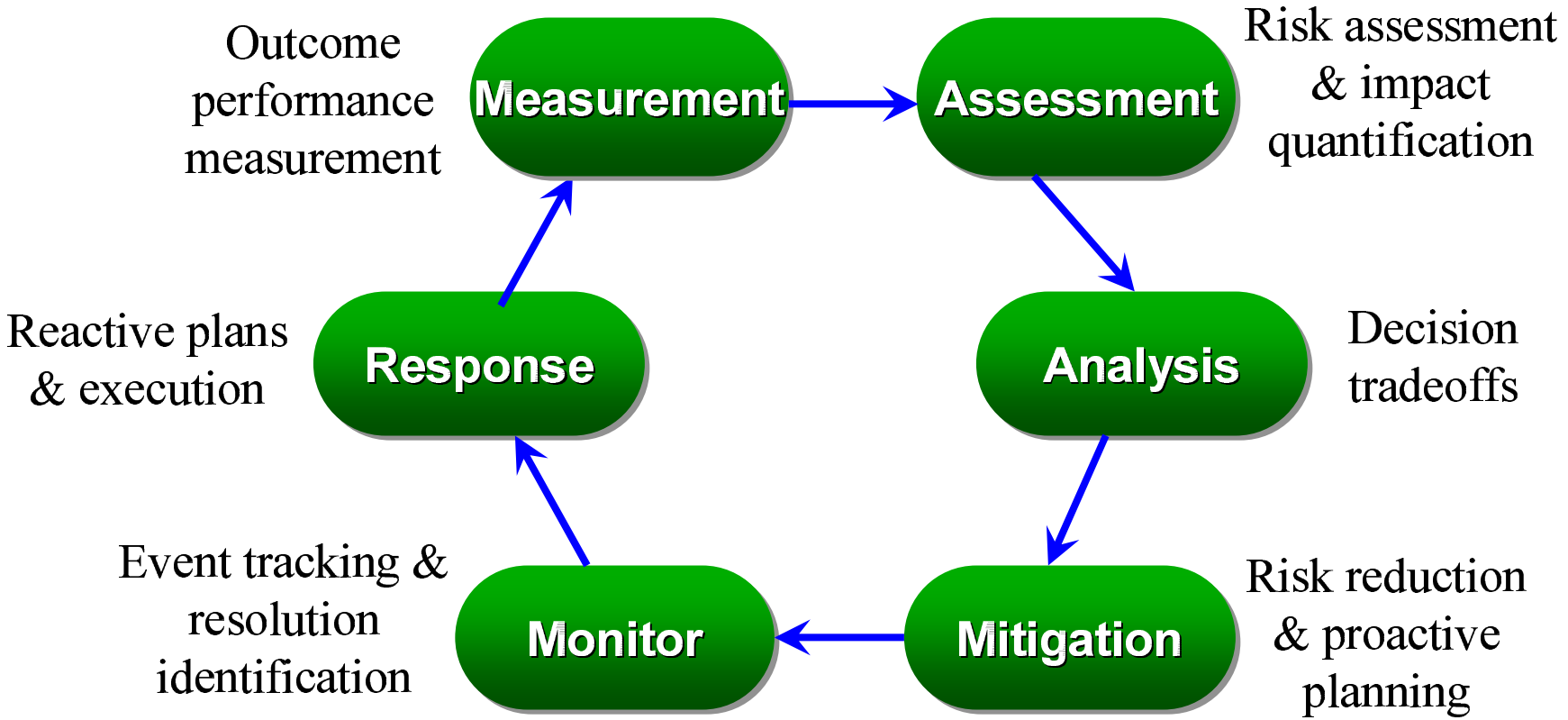
Managing Supply Chain Risk

Hau L. Lee

Stanford University

Six Beta Cycle for Risk Management



When Disaster Strikes: Example 1

Hurricane Mitch in Honduras, Guatemala & Nicaragua (Nov 1998)	Flooding destroyed banana plantations, damaging 10% of worldwide crops
Chiquita leveraged alternative sources of banana supply to maintain deliveries	Supply shortages led to Dole suffering major revenue declines

Martha and Subbakrishna, *Supply Chain Management Review*, September 2002.

When Disaster Strikes: Example 2

Earthquake in Taiwan (Sept 1999)	Power outages & damaged equipment halted supply of PC components
Dell influenced demand toward products with available components	Apple faced huge backlogs due to inability to alter product configurations

Martha and Subbakrishna, *Supply Chain Management Review*, September 2002.

When Disaster Strikes: Example 3

Mad cow and foot & mouth disease in Europe (Spring 2001)	Destruction of cattle & shortage of hides to leather goods manufacturers
Gucci had locked-in supply contracts; Naturalizer & Justin Boot had built up stocks	Etienne Aigner faced stiff cost increases as it shifted purchases to other regions

Martha and Subbakrishna, *Supply Chain Management Review*, September 2002.

When Disaster Strikes: Example 4

Terrorist attacks on NY and DC (Sept 2001)	Increased security causing cross-border delays to US auto manufacturers
DiamlerChrysler used alternate modes of transportation and contingency sources	Ford forced to close five plants for several days

Martha and Subbakrishna, *Supply Chain Management Review*, September 2002.

Sense and Response

	Sense	*Response*
Prepared-ness	Extensive information integration, knowledge sharing	Robust design, flexible capacity, supply partnerships, contingency plan
Activation & Action	Early & correct signals, smart analysis for causes & action alternatives	Responsibility/decision delegation, fast deployment, leadership for command & control

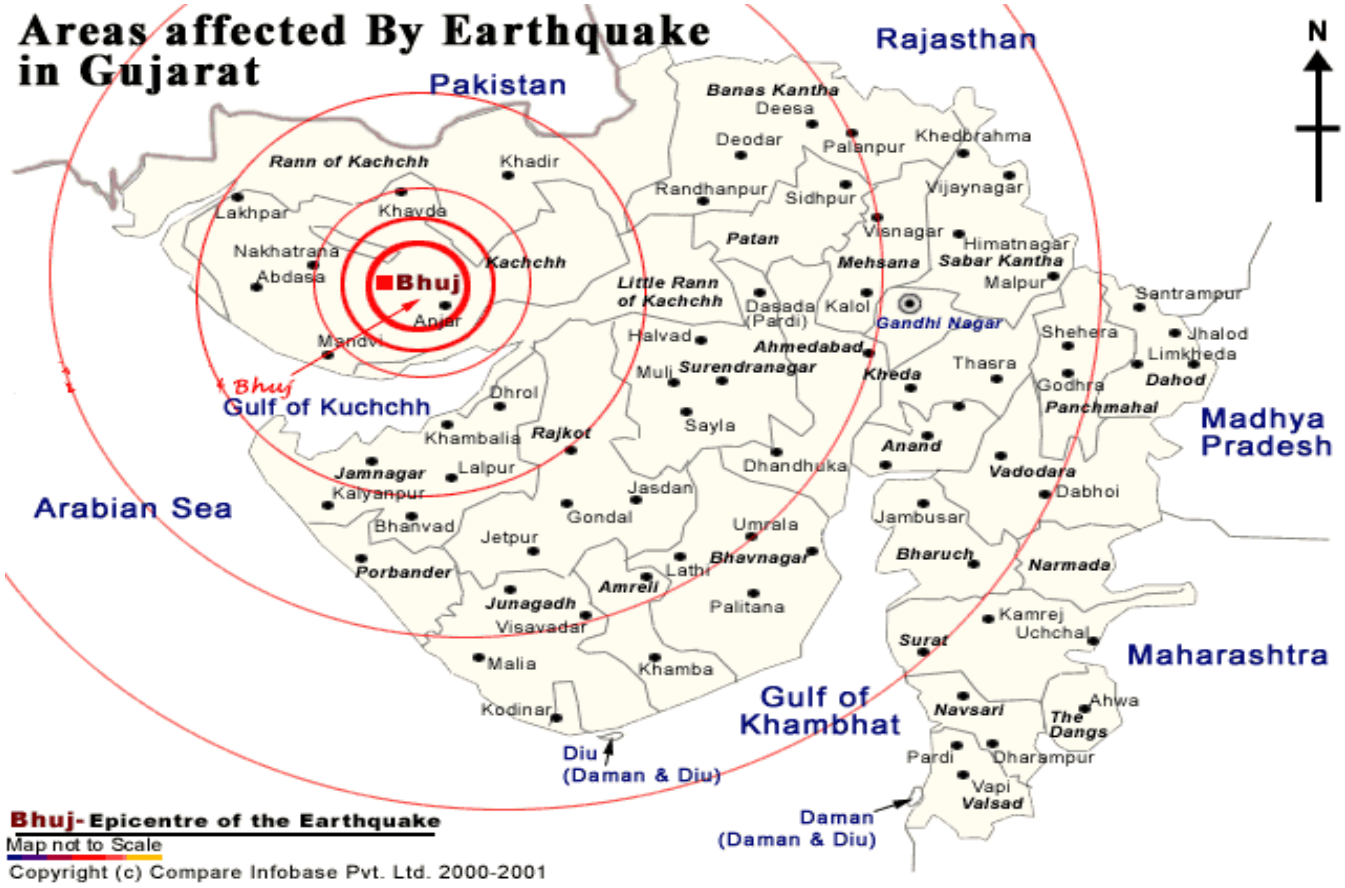
Sensible Sense & Responsive Response

	Sense	*Response*
Prepared-ness	Extensive information integration, knowledge sharing	Robust design, flexible capacity, supply partnerships, contingency plan
Activation & Action	Early & correct signals, smart analysis for causes & action alternatives	Responsibility & decision delegation, fast deployment, leadership for command & control

Disaster Relief: IFRC

	Sense	*Response*
Prepared-ness	Shared data & intelligence (DMIS), logistics software, private sector knowledge, FACT team training, experience capture	Joint NGO coordination plan, standardization, HR training, stock pre-positioning, pre-arranged supply agreement
Activation & Action	FACT teams, avoid information distortion, performance tracking, local cultural analysis	ERU teams, LSP activation, community mobilization, private enterprise involvement

The Gujarat Earthquake, Jan 2001



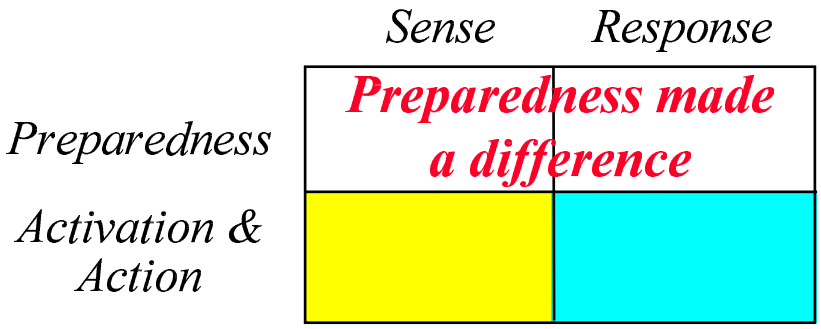
Based on Case by Van Wassenhove et al., 2002.

Disaster Response, Gujarat

- Jan 26, 2001, 8:50 am, 7.9 Richter earthquake hit Gujarat, India.
- IFRC immediate assessment: a big disaster of human losses.
- 1/26/01, information bulletin sent out to all NSs, with ERUs put on alert. DREF released CHF 200K.
- 1/28/01, FACT arrived in Bhuj.
- 1/29/01, CHF 4M committed. Appeal of CHF 25.6M launched on 1/30/01.
- 6 ERUs deployed, with blankets and plastic sheets shipped immediately under prearranged agreements with suppliers, all closely tracked and monitored. Hospital, emergency clinic and basic health care unit set up within days.
- In 30 days, 45 charter planes carried standardized 255K blankets, 34K tents, 120K plastic sheets, and others, had arrived.
- In 100 days, 300K people had been assisted. CHF 35M spent, with CHP 35-40M committed to recovery and rehabilitation.

Still, Rooms for Improvement

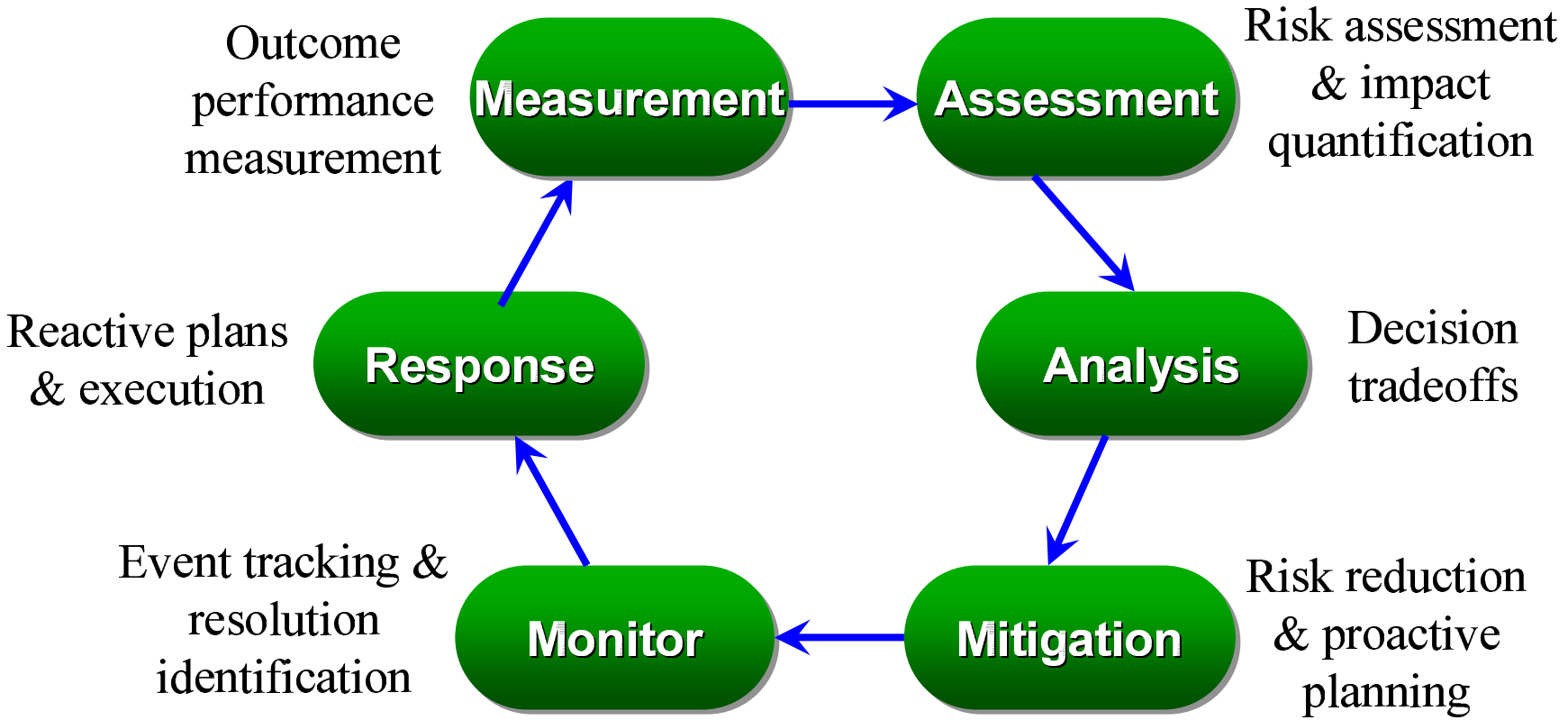
- FACT team too eager to help relief actions instead of assessing, keeping Geneva in the dark for a few days.
- Bullwhip still existed with multiple humanitarian organizations approaching same global suppliers for tent demands.
- Underestimating strong local social networks:
  - Overshooting of tent requirement by 100%
  - 160 tons of high protein biscuits shipped, 25 tons used
- First two days supplies distributed without tracking. Same for goods arriving at warehouses.



Tsunami:
India & Sri Lanka

- Sensible sense: used clothes and sandals not useful, and clogged up transportation pipelines.
- Local government key to responsive response (86% in India received government aid in first 48 hours, vs 39% in Sri Lanka).
- Coordinating roles critical (69% viewed very helpful in India, vs 29% in Sri Lanka.
- Incomplete product set (rice without cooking vessels).
- Insufficient warehousing and transportation capacities hurt relief efforts.

Six Beta Cycle for Risk Management



Sensible Sense & Responsive Response

	Sense	*Response*
Prepared-ness	Extensive information integration, knowledge sharing	Robust design, flexible capacity, supply partnerships, contingency plan
Activation & Action	Early & correct signals, smart analysis for causes & action alternatives	Responsibility & decision delegation, fast deployment, leadership for command & control

Summary

- Crisis & disruption management is now a key part supply chain management.
- From Six Sigma to having Preparedness and Activation capabilities for Sense and Respond..
- Create “Sensible Sense and Responsive Response” supply chains.
- Crisis can become an opportunity.