Bestuur van organizaties & Resilience

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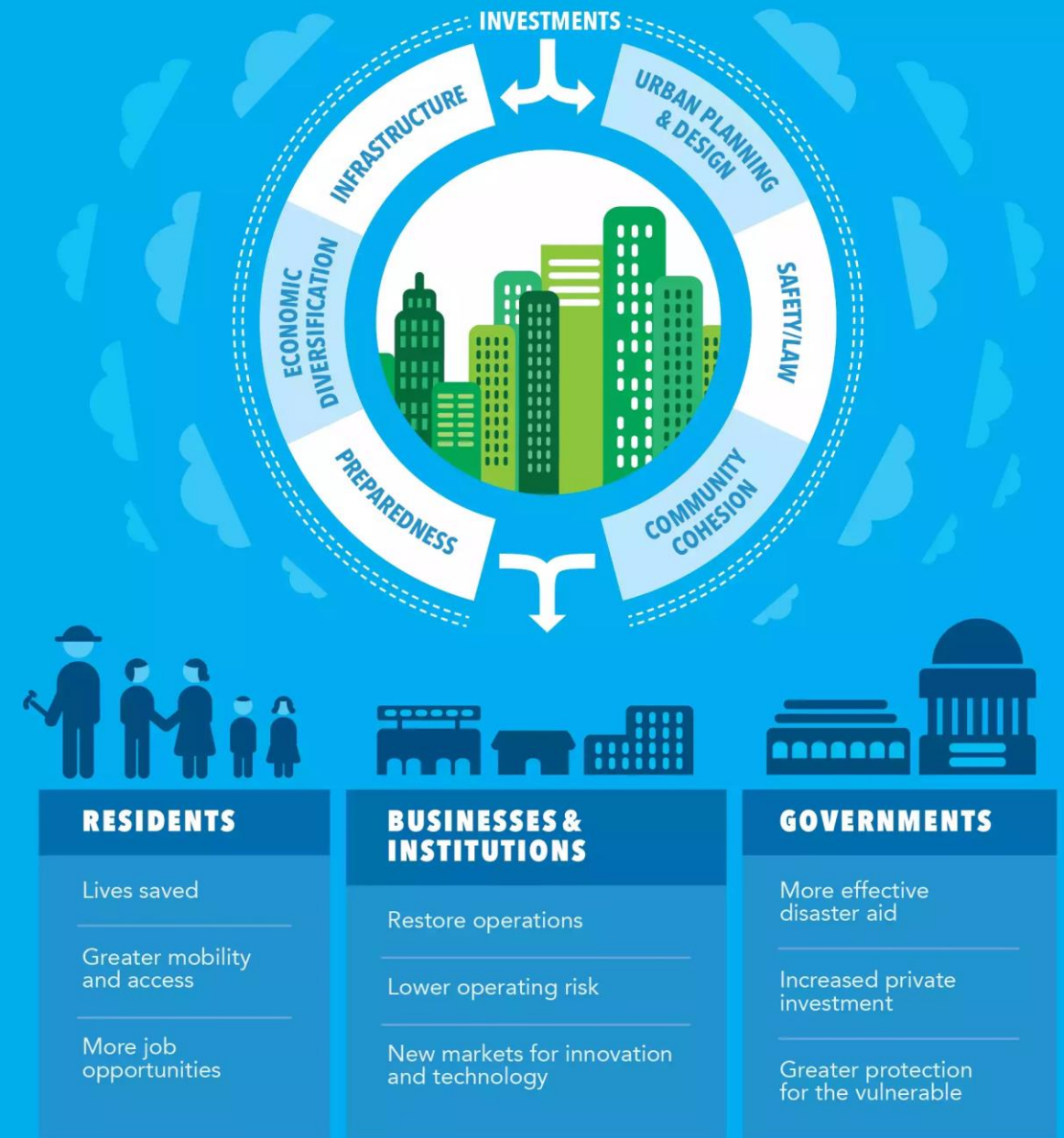
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THE RESILIENCE DIVIDEND
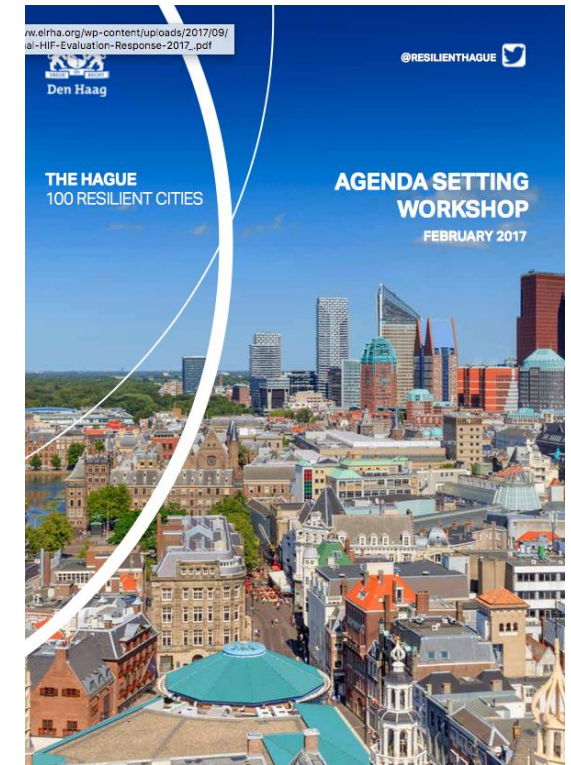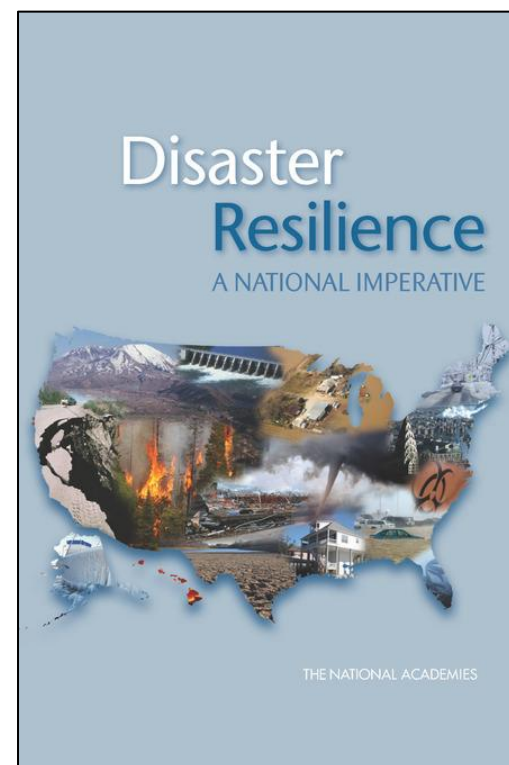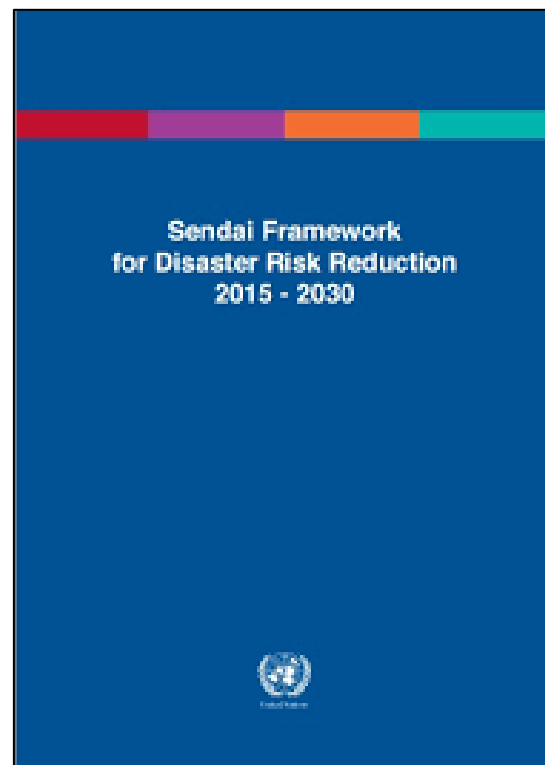
Today, humanity faces unprecedented risk

Urban populations have never faced so many shocks and stressors. Without strategic investment, cities struggle to adapt, respond and recover from disaster.

ACCELERATORS

EXTERNAL SHOCKS

SLOW-BURNING STRESSES

External Shocks:
- Natural Disasters
- Infrastructure collapse
- Terrorism
- Pandemics
- Cyberattacks
- Financial crises

Slow-Burning Stresses:
- Unreliable public transportation
- Corruption
- Water scarcity
- Crime/violence
- Poverty
- Income inequality

- Globalization
- Climate
- Urbanization

SLOWER TO ADAPT

HARDER TO RESPOND

LONGER TO RECOVER

Investment limits disaster | Investment spurs new growth

INVESTMENTS

INFRASTRUCTURE

URBAN PLANNING & DESIGN

SAFETY/LAW

COMMUNITY COHESION

PREPAREDNESS

ECONOMIC DIVERSIFICATION

RESIDENTS
- Lives saved
- Greater mobility and access
- More job opportunities

BUSINESSES & INSTITUTIONS
- Restore operations
- Lower operating risk
- New markets for innovation and technology

GOVERNMENTS
- More effective disaster aid
- Increased private investment
- Greater protection for the vulnerable

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http://resiliencedividend.org

Resilience in Practice

De facto framework for enhancing disaster preparedness, response, and recovery in the short term, and climate change adaptation in the longer term.

Cutter, S. L., Ash, K. D., & Emrich, C. T. (2014). The geographies of community disaster resilience. *Global environmental change, 29*, 65-77.

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Organizational resilience

recognizes the inherent fallibility of any organizational system and attempts to **monitor** how closely the system is operating relative to its performance limits and to **manage any deviations** as quickly as possible once they emerge

Vogus, T. J., & Sutcliffe, K. M. (2007, October). Organizational resilience: towards a theory and research agenda. In *Systems, Man and Cybernetics, 2007. ISIC. IEEE International Conference on* (pp. 3418-3422). IEEE.

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The many faces of resilience

vulnerable
flexibility
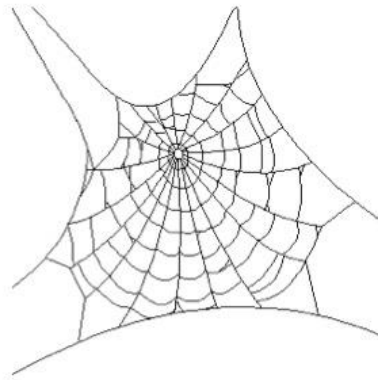
adaptive
transformation

self-organisation

Resilience

bounceback

persistence

renewal

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The four elements of a resilience framework

1. Context e.g. social group, region, institution.

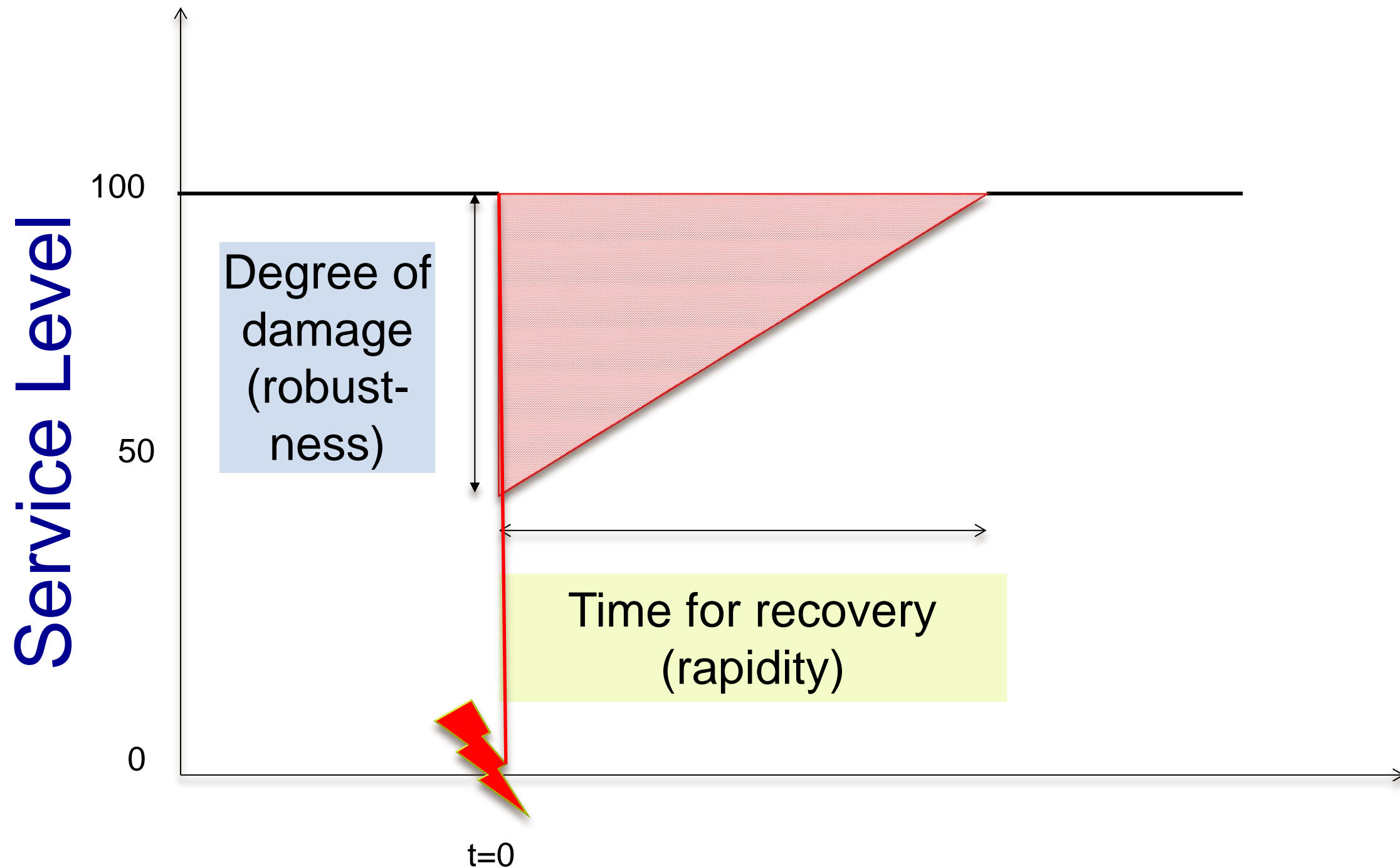**2. Disturbance** e.g. natural hazard, conflict, insecurity, food shortage, high fuel prices.

3. Capacity to deal with disturbance

4. Reaction to disturbance e.g. Survive, cope, recover, learn, transform.

Shocks

Stresses

System or Process

Exposure

Sensitivity

Adaptive capacity

Bounce back better

Bounce back

Recover but worse than before

Collapse

Resilience of what?

Resilience to what?

DFID 2011: *Defining Disaster Resilience,* London.

Resilience as "bouncing back"

Bruneau, Michel, et al. "A framework to quantitatively assess and enhance the seismic resilience of communities." Earthquake spectra 19.4 (2003): 733-752.

Hurricane Sandy

Nation's Supply Chains Disrupted by Hurricane Sandy

Analysts are still assessing the impact of closed airports and thousands of flight cancellations on cargo operations throughout the region

Holiday Shopping Is Being Threatened By Crippled Supply Chains

Kim Bhasin | Nov. 5, 2012, 10:59 AM | 🔥 438 | 💬 4

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It's the most crucial time of the year for retailers — the run-up to the big holiday season, as they try to get their final shipments into stores for the rush.

But right now, retail supply chains are in trouble. They've been crippled by the wrath of Hurricane Sandy, report Stephanie Clifford and Nelson D. Schwartz at the New York Times..

HIGH WATER

Sandy rattles links in US petrol supply chain
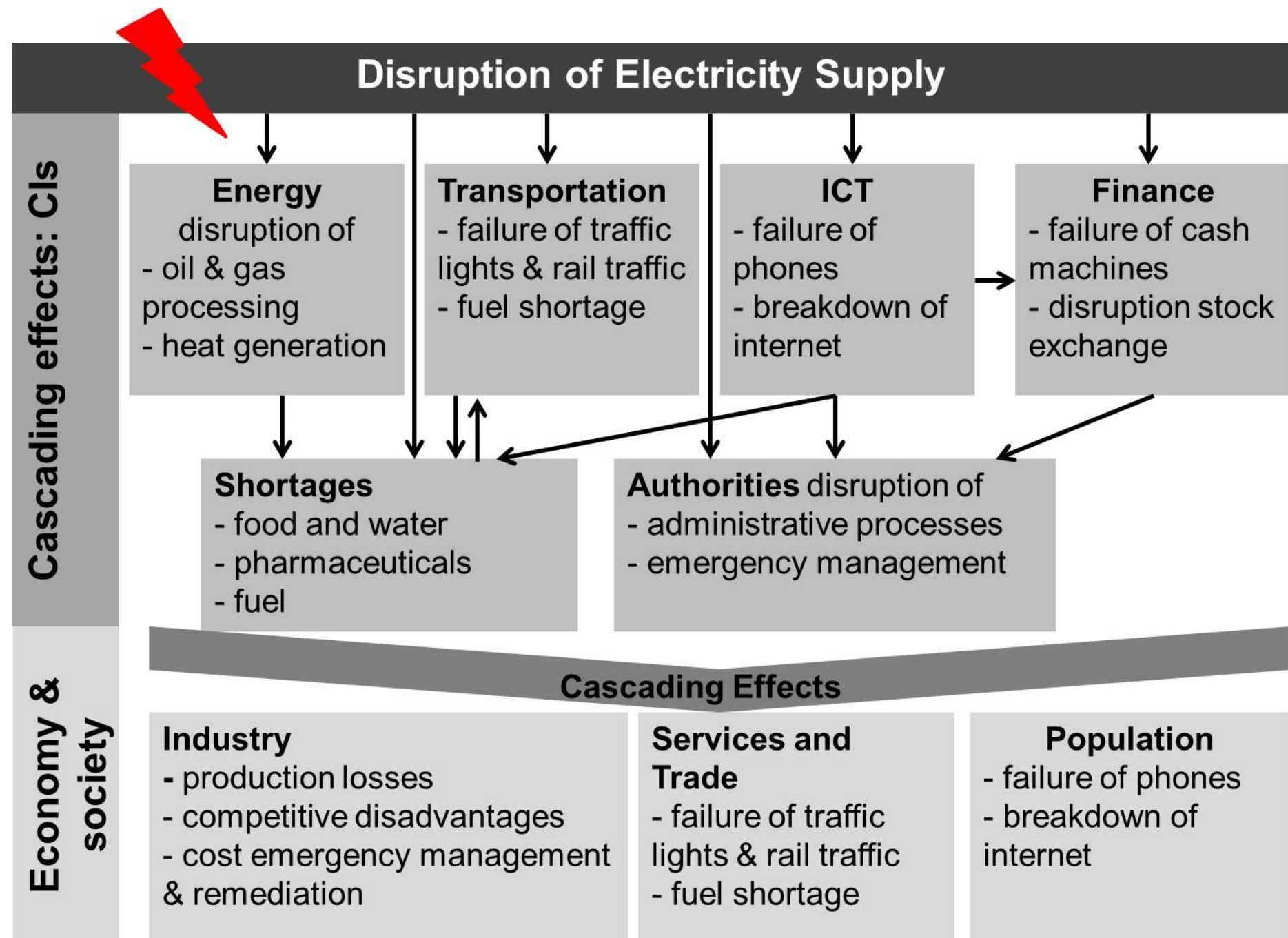
By Gregory Meyer in Bayonne, New Jersey

A worker blocks the forecourt of a New Jersey Exxon station with orange cones, yelling "no gas!" to drivers desperately prowling the highway.
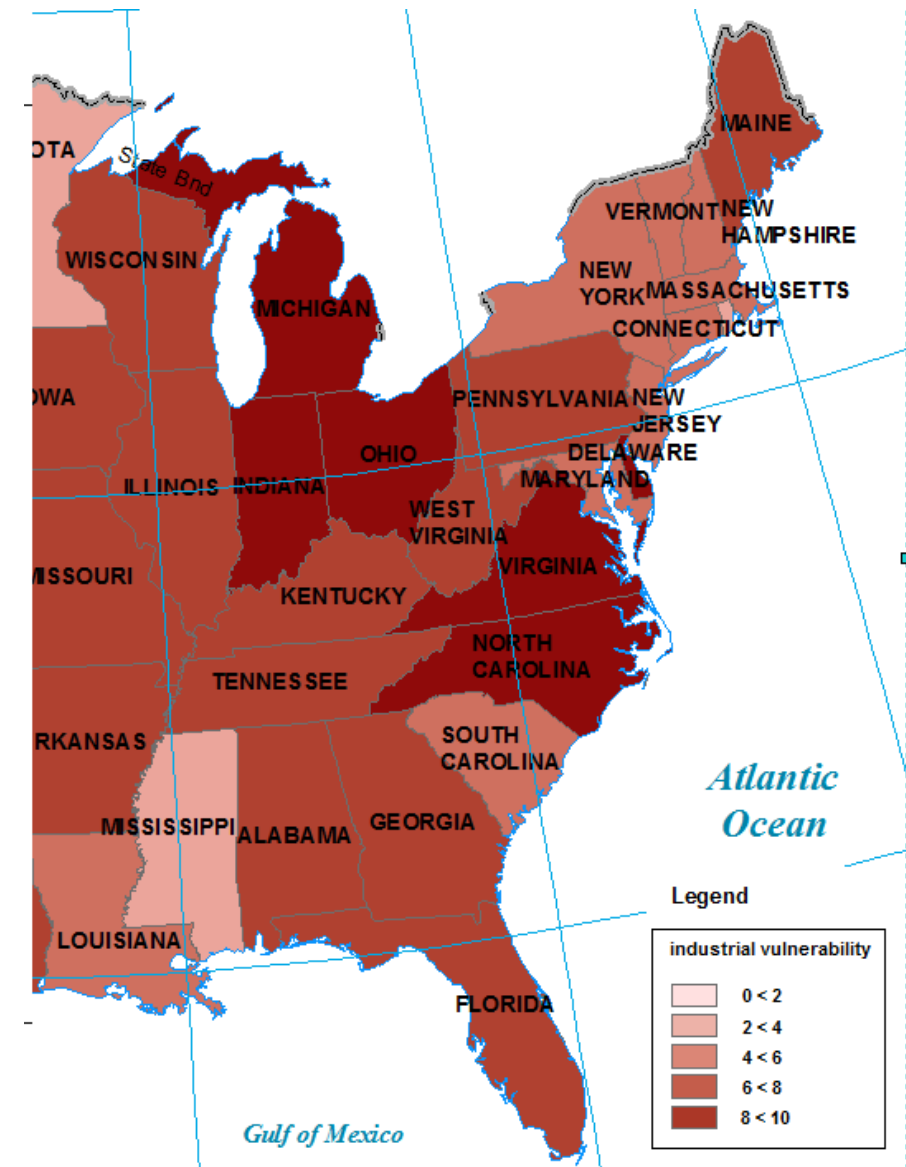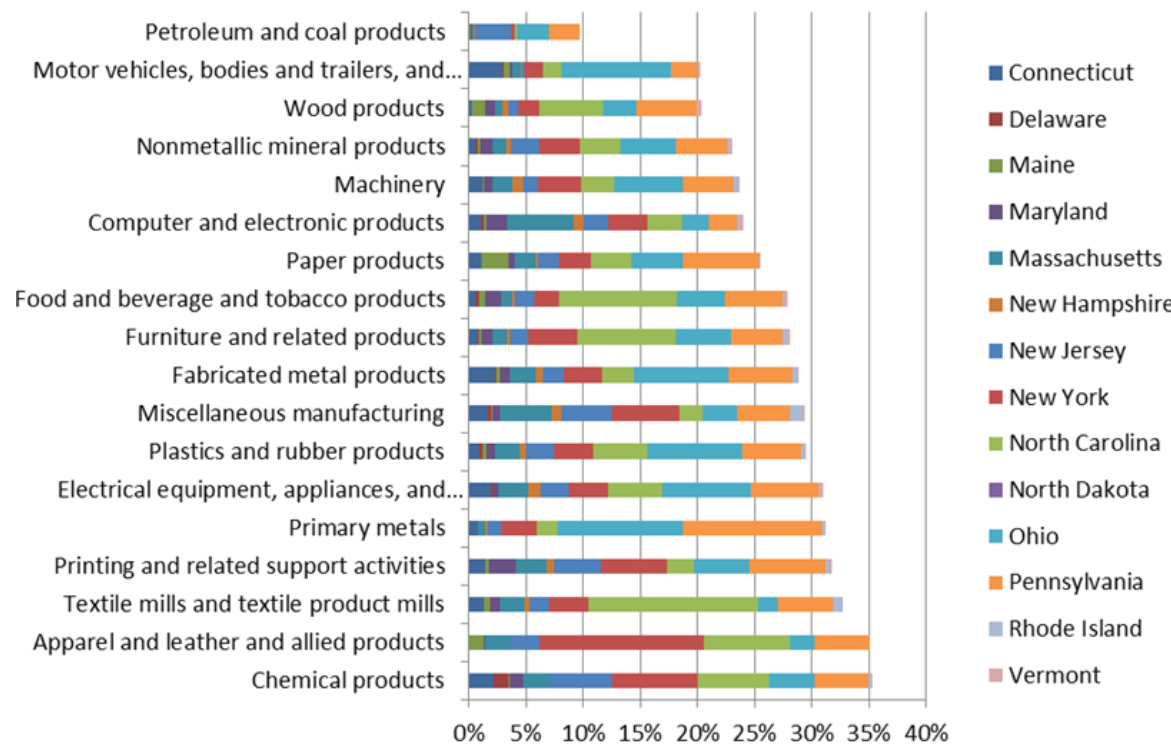
Sights like this have become common since superstorm Sandy hit the US east coast last week, knocking out petrol supplies. Except for one detail: this service station is across

Sandy led to long queues for petrol and exposed the vulnerabilities of a decentralised supply network

Critical Infrastructures: Essential for Societies

Disruption of Electricity Supply

Cascading effects: CIs

Energy
disruption of
- oil & gas processing
- heat generation

Transportation
- failure of traffic lights & rail traffic
- fuel shortage

ICT
- failure of phones
- breakdown of internet

Finance
- failure of cash machines
- disruption stock exchange

Shortages
- food and water
- pharmaceuticals
- fuel

Authorities disruption of
- administrative processes
- emergency management

Economy & society

Cascading Effects

Industry
- production losses
- competitive disadvantages
- cost emergency management & remediation

Services and Trade
- failure of traffic lights & rail traffic
- fuel shortage

Population
- failure of phones
- breakdown of internet

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Impact of Sandy: Vulnerability against power blackouts

… some years later

Rising Floodwaters Plunge Houston Into Chaos

Man-made disaster?

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CIrcle analysis of critical infrastructure dependencies that were collected during the Harvey Hackathon showing the impact colors (red is most severe) – by Micheline Hounjet, Deltares.

Nothing changed?

Self-Reliance in Institutional Voids

POLITICO INVESTIGATION

How Trump favored Texas over Puerto Rico

A POLITICO investigation shows a persistent double standard in the president's handling of relief efforts for Hurricane Harvey and Hurricane Maria.

By DANNY VINIK | 03/27/2018 05:00 AM EDT

President Donald Trump arrives at the Muniz Air National Guard Base in Carolina, Puerto Rico, on Oct. 3, 2017, for a visit after Hurricane Maria hit the island. Trump visited Houston twice during the first eight days after the hurricane, but didn't visit Puerto Rico for 13 days. | Joe Raedle/Getty Images

Bernardo Márquez, the mayor of Toa Baja, said just two pallets of water and one pallet of food arrived from FEMA in the first week, forcing local officials to rely on donations from local supermarkets and nonprofits like the Red Cross. […]

"**No communication, no coordination, no chain of command and certainly no reasonable plans given the magnitude of the problem**."

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https://www.politico.com/story/2018/03/27/donald-trump-fema-hurricane-maria-response-480557

www.comrades-project.eu

Design Principles for Resilience Platforms

| PREMISE	CURRENT STATUS IN DISASTER RESPONSE	RESILIENCE PLATFORM DESIGN IMPLICATIONS
Premise 2 - Information Focus: Data and information needs to relate to the users dealing with the disaster.	Information streams generated to support professional response are currently dominated by advocacy and programming decisions. Operational information requests are most often answered within networks of peers.	Information systems need to include operationally relevant information. This information needs to be easily be accessed, retrieved and represented in a useful format. This includes interactive approaches and dynamic maps, in which users can customize the information they see. Information source, date and reliability need to be well documented.
Premise 3 - Crisis Memory: Learning and understanding what actually happened before, during, and after the crisis is extremely important for the improvement of the response process.	There are too few reflections and lessons learned due to the reactive nature of crisis interventions and lack of professionalization and training at local level as well as the lack of an easy to use platform that tracks and monitors events and actions as they unfold over time.	A culture of continuous learning, should be implemented. This includes a culture of collective mindfulness, and the willingness to learn from past failures (Weick et al. 1999). While Geographic Information System are very useful for map- or chart-making, their true strength is in analysis – yet we rarely see any significant analytical products that aim at forecasting and planning.
Premise 4 - Exceptions as Norms: Almost everything in a crisis is an exception to the norm.	Crisis response information systems rely on standardized products and tools, resulting in the (relatively) rapid and predictable production of e.g. maps, reports, contact lists. Information tailored to the specific context of a disaster, however, is typically not produced, and only available by direct requests.	Resilience information systems need to become flexible and agile to adapt to the respective context, in terms of language(s) or pictograms; coverage and network; key issues and needs in the crisis; expertise, skills, and time available of the user.

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Resilience as "Bouncing Forward"

Recognizing structural and re-occurring disruptions

→ move from one equilibrium to another

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The Reason Model and Accident Causal Chain

Source: Adapted from Reason, 1990
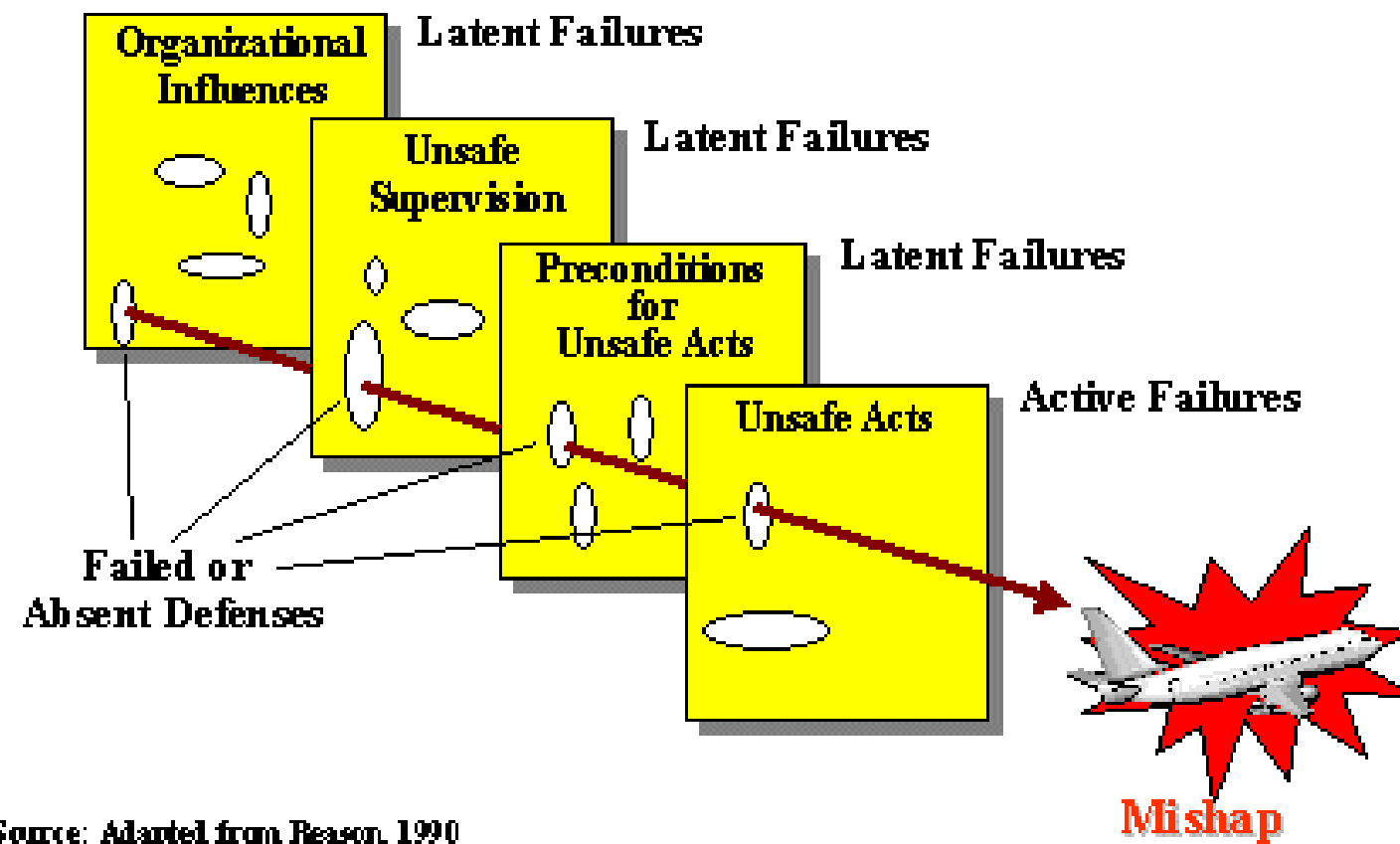
Challenge: unclear if vulnerabilities shifted – and other shocks or system changes result in new crises

High Reliability Theory (HRT)

"*How often could this organization have failed with dramatic consequences?*"

If the answer to the question is many thousands of times the organization is <u>highly reliable</u>

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High Reliability Organizations

- HROs face complexity and tight-coupling in the majority of processes they run.

- HROs are not error-free, but errors don't disable them

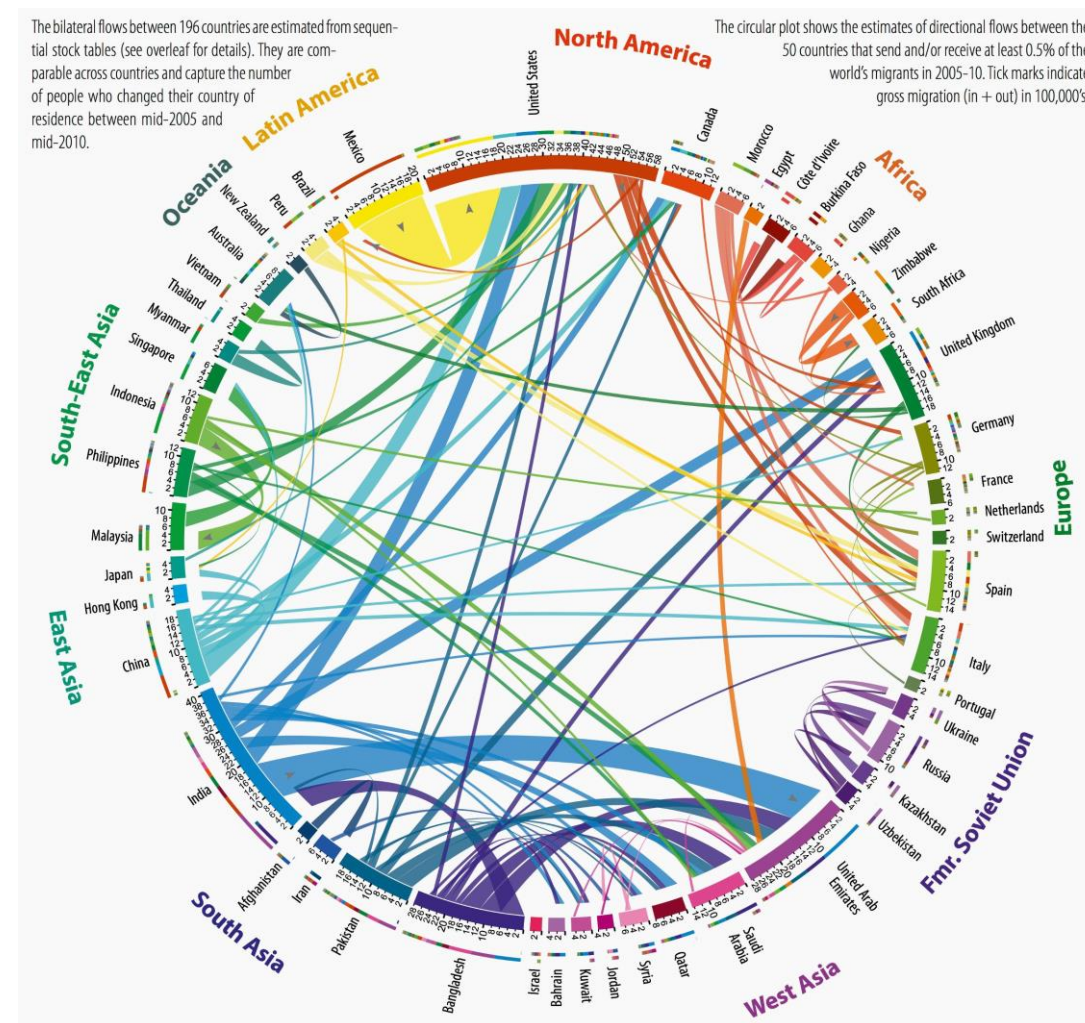- HROs are forced to learn from even the smallest errors

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What does this mean for protection?
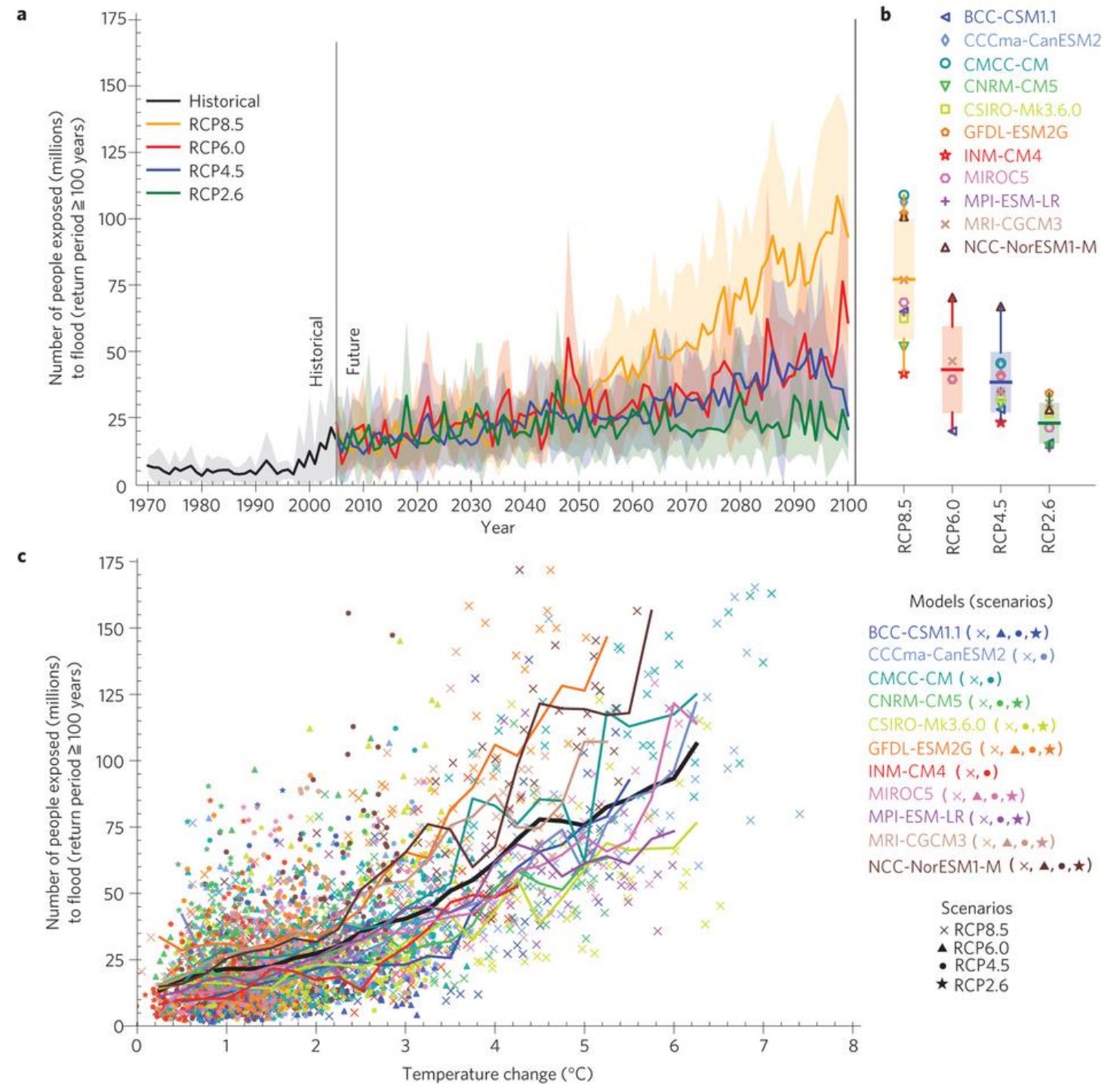
Resilience as Transformative Process

Openness: Actors in the system change

Pike, Andy, Stuart Dawley, and John Tomaney. "Resilience, adaptation and adaptability." *Cambridge Journal of Regions, Economy and Society* (2010):

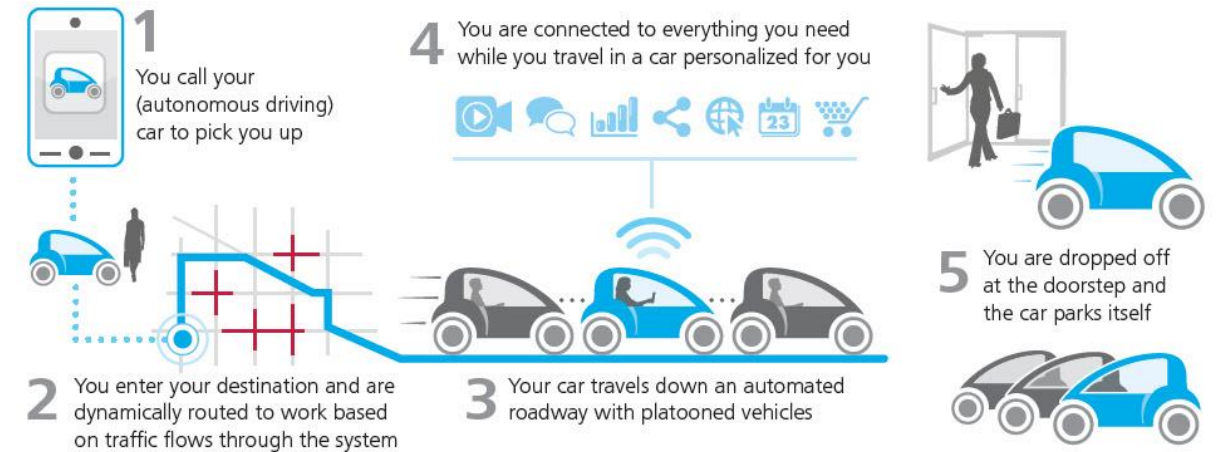# Dynamics: Model conditions and assumptions change

Hirabayashi, Yukiko, Roobavannan Mahendran, Sujan Koirala, Lisako Konoshima, Dai Yamazaki, Satoshi Watanabe, Hyungjun Kim, and Shinjiro Kanae. "Global flood risk under climate change." *Nature Climate Change* 3, no. 9 (2013): 816-821.

Adaptiveness

Challenge: policies or investments may be hard to change (*lock-in*); system needs to remain adaptive

THE INTERNET OF CARS

1 You call your (autonomous driving) car to pick you up

2 You enter your destination and are dynamically routed to work based on traffic flows through the system

3 Your car travels down an automated roadway with platooned vehicles

4 You are connected to everything you need while you travel in a car personalized for you

5 You are dropped off at the doorstep and the car parks itself

Questions?

Get in touch!

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iTRACK - www.itrack-project.eu

iTRACK at a glance

Horizon 2020

Duration:
 1 May 2016 – 36 months

Budget:
 € 3 999 212,56

Consortium:
 12 Partners, 9 Countries

Website:
 www.itrack-project.eu

Twitter:
 @iTRACKproject1

Coordination:
 University of Agder
 itrack-mgt@eurtd.com
 Tina Comes

Definitions and Expectations

Hyogo Framework of Action (UNISDR, 2005): 'the capacity of a system, community or society potentially exposed to hazards to adapt, by **resisting or changing** in order to reach and maintain an acceptable level of functioning and structure'.

DFID (2011): 'the ability of countries, communities and households to **manage change,** by maintaining or transforming living standards in the face of **shocks or stress**es – such as earthquakes, drought or violent conflict – without compromising their long-term prospects'.

100 RC: 'the capacity of individuals, communities, institutions, businesses, and systems within a city to **survive, adapt, and grow** no matter what kinds of **chronic stresses and acute shocks** they experience.'

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Disaster resilience is part of the broader concept of *resilience*

'The ability of individuals, communities and states and their institutions to absorb and recover from shocks, whilst positively adapting and transforming their structures and means for living in the face of long-term changes and uncertainty'

(OECD, 2013)

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