Five Impediments to Building Societal Resilience[i]

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Resilience and rethinking our approach to risk

During the second half of the 20th Century, *risk* came to be viewed by many (the formal risk analytics community being a notable exception) as something we should aspire to eliminate. From war to disease, the stated goal increasingly became making the world free of threats and hazards. But the 21st Century has been marked by a growing array of disruptions in the natural and built environments while threats to peace and stability abound. Further, modern society has become increasingly reliant on systems, networks, and infrastructure sectors that are interdependent. Consequentially, when shocks and disruptions occur, they often lead to cascading failures, sometimes with catastrophic consequences. The recent focus on resilience represents an appropriate countertrend that embraces the reality that risk is a given, but moves beyond formal risk assessment. Instead, it shifts the focus away from identifying and managing threats and towards building the capacity that helps to assure that individually and collectively, societies can steadfastly provide the essential functions upon which people depend on for their safety and prosperity. The resilience definition outlined in Presidential Policy Directive 21: Critical Infrastructure Security and Resilience (Feb 12, 2013) appropriately takes into account this expansive view: "The term resilience refers to the ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents." This definition comprehensively frames resilience as requiring an ongoing and organic set of capabilities that serve to assure the continuity of what a society values for it safety and prosperity before, during, and following disruptive events.

Why resilience matters

Resilience focuses attention on what it takes to develop the capacity of individuals, communities, infrastructure sectors, systems, or networks to thrive when confronted by risk. While identifying, assessing, and prioritizing the likelihood and nature of a specific threat or hazard is important, resilience aims to develop the means to withstand, respond, recover and adapt to man-made and naturally-occurring risks, whether they come with or without warning. Building resilience necessitates a deep understanding of human factors, the built environment, and the natural environment and how they interact. It also places special emphasis on identifying and validating the

attributes, functions, and values whose loss or disruption would be undesirable or harmful. Too often this knowledge of what needs to be safeguarded is taken for granted. As a result, myopic efforts to reduce or eliminate risk often overlook trade-offs and can even end up compromising the very things that we need to safeguard in order to assure our way of life and quality of life. Further, solutions that focus primarily on preventing threats and hazards can end up being suboptimal since interdependencies are overlooked, with the result that they only become apparent in the wake of disruptive events that generate cascading failures. In short, understanding and advancing resilience draws on knowledge derived from the field of risk management, but resilience is a strategic societal imperative that necessarily involves much more than the management of risk. Ultimately, the aim of resilience is to assure that the communities and the systems not only navigate known and unknown risks, but become stronger and more successful while transiting perilous waters.

Developing resilience

In the face of a growing array of 21st-century risks, what is needed is the rapid deployment and widespread adoption of resilience-building knowledge, technologies, and skills. Vitally, this will require extensive engagement and collaboration amongst industry, commercial innovators, thought leaders, researchers, technical experts, and public sector practitioners who share a commitment to building societies that can successfully manage, bounce back from, and adapt to man-made and naturally-occurring hazards. Key to scaling this effort quickly and globally is the need to devise new resilience standards and guidelines. Additionally, national and international efforts must be supported by recommended public policy actions, training and education, innovative market-based incentives, and greater public awareness and support for investing in resilience practices.

Measuring resilience

The central goal of resilience is to assure that the core functions and values of a society not only survive, but thrive when confronted with disruptive events. Since this goal is incontrovertible and universally desirable, the reason why we are far from achieving it suggests that there must be daunting barriers in our way. Accordingly, one way to measure our progress towards building resilience is to identify the success at which we can overcome five major impediments:

1. There is a tendency at the societal level to overestimate current capacities to respond in near-real time to challenges once they emerge and to discount the need to react to leading indicators of potentially disruptive events in our future such as climate change. Meanwhile, a preoccupation with extracting greater efficiencies and reducing costs for legacy and new infrastructure often translates into systems that lack adequate capacity to function in the face of extreme events.
2. There is a lack of an integrative approach to advancing resilience across complex systems and networks. For instance, there is no widely accepted consensus on what resilient infrastructure is, with the result that there are only localized success stories in disparate domains, for discrete hazards. Most ongoing resilience research efforts are isolated within specific academic disciplines. As a result, too little understanding or insight informs the design parameters and operational issues necessary for system- or network-wide resilience.
3. There are pervasive disincentives for building greater resilience. Public and private entities have become skilled at transferring risk to someone else and not working collaboratively to

take risk on directly. Further, there are few generally accepted resilience standards or validated best practices for which markets can rationalize providing rewards for entities who invest in resilience.

4. There is a dearth of appropriate frameworks for managing organizational and governance issues that match the complexity of interdependent systems and networks. Transport, communications, energy, and water infrastructure systems with increasingly embedded cyber vulnerabilities sprawl across multiple political jurisdictions. Ownership and operations are public and private, large and small, and both highly regulated and loosely regulated. This translates into incompatibilities across the network of organizations and stakeholders, inhibiting local actions due to the feeling that "I can't do it by myself, and others are not moving in the same direction."

5. There is a lack of adequate training and education programs that draw on the kind of interdisciplinary collaboration across technical, non-technical, professional and research programs that is required to advance a comprehensive approach to building resilience.

Actions that overcome these five barriers can be measured and will collectively support the building of greater societal resilience.

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