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RESILIENCE: A TOOL FOR PREPARING AND MANAGING EMERGENCIES

In recent years, the concept of resilience has gained traction; its application has expanded significantly from physical and technical systems to the organizational, social, and economic spheres. Increasing global complexity, transnational risks, and unpredictability have created an environment where ensuring security is more difficult. Resilience offers the guiding principles and modern framework to manage today's uncertain environment and can be used as a tool to strengthen emergency preparedness efforts.

Not all catastrophes can be prevented: A rescue helicopter evacuates residents from their apartments in the flooded city of Berne, Switzerland, 24 August 2005. *Reuters / Marcus Gyger*

Resilience is the ability of a system or society to absorb and recover quickly after experiencing a sudden shock or physical stress. In the 1990s, concerns about the growing interdependence and vulnerability of information and physical infrastructures, coupled with the threat of international terrorism, led to infrastructure protection being couched within national security discourse. This also influenced efforts to begin looking at ways to enhance the resilience of technical systems.

Contemporary security challenges, however, are a mixture of collective (global) and classical (domestic) security problems that are extensive, disproportionate, complex, and largely uncertain. Major natural disasters such as Hurricane Katrina, which struck New Orleans in 2005, coupled with the growing consensus on systemic challenges posed by transnational, interlocking risks, have created a notable shift in how states view security. Inspired by this development, the concept of resilience is increasingly being applied to society as a whole, where non-state actors play a more prominent role. This is driven by the recognition on the part of many states that ensuring security is an increasingly daunting, if not impossible, task. Disruptions at any level are inevitable due to the difficulty of identifying and addressing all vulnerabilities and threats. This makes the risk management and resilience paradigm well suited for conceptualizing modern challenges.

It is useful for states to apply the resilience paradigm to these issues as a way of gaining new tools to mitigate the effects of disasters and cope with global instability and climatic change. Moreover, it offers an updated framework for emergency preparedness (EP) efforts. By incorporating resilience into their EP strategy, policymakers and first responders are encouraged to engage all stakeholders in managing risks and ensuring that communities are more resilient overall. To this end, they should identify and articulate roles, strengthen and consolidate communication channels, and build community capacity to prepare, manage, and quickly rebound from numerous threats.

Building highly resilient societies

Resilience has a rich background in various disciplines, including psychology, ecology, environmental science, engineering, management, and organizational behavior research. As a concept, it continues to evolve and to be applied to new areas; more recently, it has been put to use in the domains of emergency preparedness (EP) and hazards, where a resilience perspective can improve efforts to prepare and respond to risks. In this area, the resilience cycle – which includes mitigation, preparation, response, and recovery – serves as a guide and can help officials distinguish between physical and social systems that are highly resilient and those whose resilience

is low. In a high-resilience system, risk is distributed, challenges are commonly understood, and response efforts are coordinated. Such systems are furthermore embedded in risk communication and strategic risk management principles. Conversely, in a low-resilience system, risk has a disproportionate impact on certain sectors, and a society struggles to cope with and rebound from a crisis. The main challenge, thus, lies in crafting high-resilience societies.

While adaptability and flexibility are common characteristics found within a high-resilient system, the R4 framework expands upon this and identifies four specific attributes. The first, robustness, refers to the capacity of a system to withstand stress, followed by redundancy, which denotes the alternative options that are available to a distressed system. The third characteristic, resourcefulness, concerns the capacity of a system to mobilize and respond to an emergency, while the fourth, rapidity, applies to the speed in which it takes a system to overcome challenges and rebound. Within the resilience cycle, robustness and redundancy are part of the pre-emergency phases (mitigation and preparedness), while resourcefulness and rapidity belong to the emergency and post-emergence phases (response and recovery). The R4 framework, when applied to the resilience cycle, can aptly inform EP strategy. In order to incorporate and promote this approach within a community, four elements are crucial: foresight and planning; trust and partnering; leadership; and resource identification.

Foresight and planning exercises encourage local officials to forge relationships with stakeholders and build awareness. This is accomplished by sponsoring community discussions on emergencies, classifying potential impacts, and carrying out simulated emergency drills. For example, the July 2005 bombings of London's transit infrastructure revealed flawed emergency plans that did not factor in the individual's role during a major event. Commuters who were at the site of the bombing – before responders could arrive – did not have basic emergency response information to guide them through the disaster. This case highlights a common feature of many emergencies in that ordinary citizens are typically at the scene before officials, and must operate on an ad-hoc basis. Foresight and planning exercises can inform communities about roles and streamline response efforts for a faster recovery.

Building community trust and partnerships improves communication channels, which are central to successful emergency response efforts. For example, Operation Golden Phoenix in Los Angeles, California is an annual disaster training event that simulates a major emergency and involves local, state, regional, federal, academic, non-governmental, and private sector organizations. A major benefit of this event is that it creates a trust-building forum where personal relationships are developed. Strong leadership is also important, as leaders can establish objectives, organize and monitor activities, and ensure coherence in the communication strategy.

Knowing which resources are available during emergencies boosts the capacity of a community to weather a crisis. In the case of the London bombings, passengers did not have access to first aid kits and had difficulty exiting the train carriages, as the doors could only be opened by train personnel. Their knowledge about the available resources to cope with the crisis was severely limited. The Golden Phoenix exercise, on the other hand, involves the community by informing participants where to locate potential resources during a crisis situation. This also aids them in identifying alternative disaster management sites, emergency housing options, and technical fallback options.

"The main challenge lies in crafting high-resilience societies."

Resilience in practice: US and UK

The United Kingdom has been the leader in applying the concept of resilience to security. It first incorporated this concept to enhance the management of infrastructures and limited the discussion between public and private entities, such as formal institutions and organizations operating technical systems and critical infrastructures. This approach included developing legislation, public-private partnerships, and sponsoring discussions on risk management. By 2001, the UK introduced resilience into a broader security strategy through the creation of the Civil Contingencies Secretariat, which aimed to improve overall UK preparedness in the event of an emergency, regardless of its origin.

Resilience-building efforts have since accelerated. UK Resilience was developed

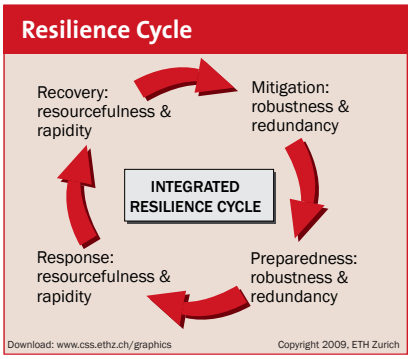

Figure based on Charlie Edwards, Resilient Nation

to provide various resources for sharing knowledge in the interest of ensuring business continuity, emergency information and planning, and civil engagement (cf.). Direct.gov is another web resource where visitors can find information on preparedness and receive advice for developing community groups, organizing volunteers, and learn about common risks within each region (cf.). The UK has also developed Regional Resilience Teams (RRTs) to manage relationships with local responders and bridge communication channels between regional partners and government departments. The RRTs also support the Regional Resilience Forums, which consist of emergency services and other responders working together on emergency preparedness issues.

In the United States, a significant shift in perception and terminology was brought about by Hurricane Katrina in 2005, when ill-equipped infrastructure paired with poor emergency response efforts and the failure to inform or coordinate the general public resulted in greater damage and delayed recovery. As a result, the Department of Homeland Security (DHS) adopted an all-hazards approach to assessing threats, and the US Critical Infrastructure Task Force identified resilience, rather than protection, as a priority. Today, this concept of resilience is no longer limited to infrastructure, as it has been adopted into federal emergency preparedness and management efforts aimed at promoting highly resilient communities.

This development is illustrated by the National Security Council's decision in May 2009 to form a new directorate where resilience is a cornerstone to preparing and responding to a domestic WMD attack, pandemic, or natural catastrophe. In other federal offices, the Federal Emergency Management Agency (FEMA) offers training programs designed around building highly resilient communities and

is strengthening the work of the Community Preparedness Division, which focuses on the role of non-state actors in disaster response and management. Likewise, the DHS has made resilience a key element of homeland security, launching Ready.gov, a website that provides guidance on disaster preparedness and response for communities (cf.). Overall, the strategy reveals an emphasis on providing information and creating more accessible channels for a multitude of stakeholders.

Role of new technologies

Information and communication are major components of a highly resilient society. The advent of the internet, mobile phones, and other information and communication technology (ICT) has revolutionized how people interact and share information. In fact, this process is likely to accelerate as ICT develops further. ICT can reinforce EP efforts to enhance resilience at all levels. In fact, while ICT, such as mobile phones, can be useful – yet also limiting, due to system congestion – during emergencies, they can be more effective in the prevention stage by getting people involved earlier.

Emergency response officials, for example, can use websites to provide up-to-date, high-quality information, to share emergency action plans, and to promote other services such as RSS feeds, e-mail newsletters, blogs, and more recently, social media tools. FEMA has a podcast program and is developing online video segments that will feature disaster survivors and briefings. The aim of this effort is to provide information on FEMA's role and abilities in emergency situations as well as reinforcing EP recommendations.

Regional offices use Twitter (a microblogging service) to communicate with the public about potential emergencies and receive tips from individuals about approaching storms, thus giving authorities an early opportunity to communicate safety tips and mitigate potential injuries. Local efforts reflect the Los Angeles Fire Department (LAFD) incorporation of mobile phones, Twitter, Flicker (photo sharing), blogs and live Internet radio into their preparedness and response work. 'LAFD Alert' is a Short Messaging Services (SMS) delivered by mobile phones to community members who receive alerts on regional fires and can also send authorities messages about potential emergencies.

Such examples highlight a process of communication where technology can help local governments and emergency responders exploit all communication channels and interact with the public throughout the resilience cycle. This can also help facilitate the process of civilian reporting to authorities and relationship building throughout the community.

Implications and efforts in Switzerland

Resilience is a flexible concept that can provide the guiding principles to managing a risky, uncertain environment. Nonetheless, challenges remain. Adopting this concept requires a coordinated and mindful process combined with strong leadership that fuses together federal and local efforts. Creating coherence between the several government sectors can be complicated. The approach is further limited when information is not distributed, flexibility is sacrificed due to organizational constraints, and roles are not articulated between the various stakeholders. Thus, building resilience is a deliberate course of action that has its benefits, but can also create organizational confusion and disputes unless carefully implemented.

In Switzerland, resilience is embraced at the federal, cantonal, and local levels; however, efforts remain limited and concentrated in the technical sector. Applying resilience more broadly can improve Swiss emergency preparedness efforts and help engage stakeholders. Nevertheless, the challenges involved in implementing a Swiss resilience policy are mainly due to the lack of a common understanding of resilience across all sectors, the need for a collective communication strategy, and organizational limitations.

First, Switzerland should develop a common understanding of resilience across the federal, cantonal, and local levels. Currently, the concept is vaguely understood as the overall capacity of society to cope with a crisis situation. It should be defined more specifically so as to inform policy building and implementation. Second, a collective risk and emergency communication strategy is required that links the various public and private sectors as well as individual actors not directly affiliated with the latter. Information-sharing and communication plans can provide guidelines for enhancing multi-sector coordination and can assist quick responses to disasters. Non-state actors can provide early information before a crisis occurs and can improve their preparations for coping with a major hazard event by knowing the potential risks and their own roles. Additionally, public entities can strengthen relationships and exchange information by using ICT. Mobile phones, digital cameras, and the plethora of online platforms have made societal engagement more accessible and affordable.

Lastly, current organizational limitations affect the capacity for flexibility and rapid mobilization. However, an EP strategy that is informed by the resilience framework will guide efforts to define resilience and create a plan that is grounded in a common communication strategy. Sharing information and knowing which channels to utilize in an emergency will facilitate quick responses and help overcome bureaucratic constraints.

"Applying resilience more broadly can improve Swiss emergency preparednessefforts and help engage stakeholders."

Switzerland's five core principles for critical infrastructure protection

- Holistic approach to risk management
- An all-hazards threat spectrum
- Resilience
- Maintains commensurability between the protective provisions taken and the risk estimate
- Subsidiary between public and the private infrastructure operators

The Federal Council's Basic Strategy for Critical Infrastructure Protection: Basis for the national critical infrastructure protection strategy .

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