Advancing Resilience through Law[i]

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Introduction

Resilience is the capacity of a system to "bounce back" from an adverse outcome. It is the complement to traditional risk management – which seeks to avoid or minimize the occurrence of adverse events. But when risk avoidance fails and an adverse event does occur, resilience is the strategy that seeks to limit the scope and duration of the resulting damage, and to restore the system to a favourable (even if different) state.

Resilience vs Risk

A rational risk governance system would include elements of both risk avoidance and resilience. They are both essential, although traditionally our efforts and attention have focused primarily on the risk management/avoidance side. But as the world and its technologies gets more complex, and in response to a series of natural and human disasters (e.g., Hurricanes Katrina and Sandy, the Deepwater Horizon oil spill, and Fukushima), greater attention is now being given to the resilience side of the ledger.

The appropriate mix of emphasis on risk avoidance and resilience will vary depending on the nature of the problem. For risks that are well-characterized and can be effectively controlled, the priority should be on risk avoidance through traditional risk assessment and risk management strategies. But where risks are unknown or cannot be easily calculated or controlled, as is the case with many emerging technologies such as nanotechnology or synthetic biology, more emphasis should be put in ensuring effective resilience measures are in place to quickly mitigate and control any unanticipated problems that cannot be or are not prevented by traditional risk assessment and risk management.

Law and Resilience

To date, resilience has primarily been instituted as a management or voluntary professional undertaking by experts in fields such as engineering, environmental management, disaster planning

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and response, healthcare planning, and public utilities. Law has historically provided little incorporation, guidance, or requirements for resilience (Ruhl, 2011). Law, especially regulatory law, has been mostly ex ante – addressing potential risks in a "one and done" front-end approach that involves a single rulemaking that seeks to put in place rules to prevent potential problems before they happen (Shapiro & Glicksman, 2004). This pre-emptive approach is not equipped to address unanticipated consequences or problems that arise after enactment of the governing statute or regulation (Odom Green et al., 2015).

A more adaptive management approach is needed in which applicable rules and statutes can be modified to address unanticipated outcomes and problems. Unfortunately, the administrative law requirements in most countries, under which regulatory agencies operate, are not conducive to more adaptive and reflexive approaches, as they tend to require time-consuming and burdensome processes every time an agency changes course. While some proposals have been published for making regulatory systems more adaptive and responsive (e.g., Craig & Ruhl, 2014), such proposals have generally not been implemented to date.

Nevertheless, there are useful examples in existing regulatory structures that do implement a resilience strategy, even if implicitly rather than explicitly applying the concept of resilience (Marchant & Stevens, 2016). These existing examples point the way to a more comprehensive legal incorporation of resilience. There are two major categories of legal resilience measures – procedural and substantive (Marchant & Stevens, 2016). Procedural resilience measures put in place a process for early detection and amelioration of problems or harm. Substantive resilience measures put in place harm reduction and adaption measures ex ante to be better prepared to deal with harm if and when it occurs. Some examples of procedural and substantive legal resilience tools are described below.

Procedural Resilience Legal Tools

Procedural legal resilience tools give a regulatory agency authority to periodically review the effectiveness of its regulatory program, and perhaps take quick action to remedy any gaps or flaws in the program. Such tools essentially allow agencies to take an adaptive management approach, which is usually inconsistent with most national administrative law frameworks. For example, under the U.S. Clean Air Act, the Environmental Protection Agency is required to re-assess the scientific evidence and protectiveness of its air quality standards for criteria pollutants such as ozone and particulate matter, and to revise those standards if they are not adequately protective.

Requiring regulatory agencies to produce and update action plans for dealing with an ongoing problem is another way to institutionalize procedural reliance measures. In the U.S., President Obama issued Executive Order 13,653 on November 1, 2013, which required each federal agency to create and update periodically a climate change Adaption Plan that includes "a description of programs, policies, and plans the agency has already put in place, as well as additional actions the agency will take, to manage climate risks in the near term and build resilience in the short and long term."

Another procedural resilience approach is to authorize agencies to depart from their statutory requirements if and when something goes wrong and unanticipated adverse effects occur. Again, traditional administrative law requirements are an impediment to such changes in direction, as

agencies are generally precluded from over-riding or departing from legislative dictates. There has nevertheless been a growing use and support for the principle of "administrative forbearance" that allows agencies to put a hold on statutory provisions and programs when, for example, they are creating a problem that needs to be stopped and reversed, an important resilience capability.

Substantive Resilience Legal Tools

The other set of legal resilience tools involve regulatory requirements that substantively provide for more resilient systems. A threshold challenge for such approaches is that it is difficult to put in place substantive measures to remedy unanticipated harms that might occur in the future. If you cannot anticipate specific harms *ex ante*, it becomes problematic to design applicable remedies for that harm. One generic strategy is to require that companies engaging with a particular activity or technology to carry appropriate liability insurance or post a bond to ensure adequate resources are available to mitigate any harms that result. For example, such requirements have been put in place for hazardous waste treatment, storage and disposal facilities (TSDFs) under U.S. hazardous waste laws.

Another substantive legal resilience approach is to put in place secondary back-up systems for when the primary regulatory approach fails to achieve its intended objective. For example, under the Clean Air Act (CAA) and Clean Water Act (CWA) in the United States, non-attainment provisions automatically kick in if the primary regulatory approach (state implementation plans under the CAA and category- specific effluent limitations under the CWA) fails to achieve safe pre-determined levels of air or water quality.

Another important substantive resilience tool is the power to be able to recall or inactivate a technology or product that is found to be causing unanticipated harms. For example, a "kill switch" might be engineered into a synthetic biology or nanotechnology product so the product can be quickly inactivated if it is found to be causing unanticipated harms.

Conclusion

While law has been a late arrival at the resilience table, it has an important role to play in putting into place both procedural and substantive regulatory provisions for ensuring more resilient systems.

Annotated Bibliography

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