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Preface

This is the sixth in a series of white papers sponsored by the Kean University Center for History, Politics, and Policy. Kean faculty will continue to offer their expertise in future white papers through the 2012-13 academic year.

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A “Sandy” Storm of Criticism: Moving away from Elusive and Illusory Answers and Towards Attainable and Genuine Solutions

Facing the Storm

It has been five months since Sandy made landfall in New Jersey. Arguably, the impacts were felt throughout the United States (commerce and transportation) and worldwide (financial markets) to an extent not seen since the later stages of the Industrial Revolution. Every New Jerseyan is aware of someone who either experienced minor damages and inconvenience as well as others who suffered a total loss or major destruction of their way of life. Faced with one natural disaster after another, the modern era of billion-dollar disasters has suggested connections to global climate change, climate variability, and even weather control. These alternate with battle cries of rebuilding “bigger, better, and stronger” to withstand the onslaught of natural hazards.

Invariably, these also lead to disputes such as those surrounding coastal zone management (dunes, building restrictions, beach access) and/or insurability (premiums, deductibles, and qualifying limits). Unfortunately, after much debate and positioning there is often little change as actions stall and the realities of legal, judicial, and other challenges and entanglements take hold. This and follow-up criticisms can also lead to a media “battle that is well-publicized and driven by specific interests and in which policy debates go on and on and on.

Raising Questions

Amid all the discussion about rebuilding, is it possible that we are missing a more important message that cuts across all natural hazards and all locations? Here are some questions that ought to be raised in the aftermath of Sandy:

- Why does it seem that there is a greater vulnerability to extreme weather? How is it that in spite of our elaborate preparation and preventive strategies a storm is still able to wreak havoc and create major damage and economic loss?
- When our mitigation and avoidance tactics have been shown to be inadequate, what is it that we have failed to comprehend after decades of storm tracking and improved engineering of structures? How is it that with mass communications, advance notice and warnings, and highly specialized forecasts of conditions that we are experiencing death and injury tolls previously associated with storms from the 19th to early 20th centuries – particularly given heightened awareness and education about our natural environment? Together, these questions suggest a nexus has been reached at which the convergence of natural hazards in the environment with modern and existing infrastructures – and our collective responses and reactions – are simply incompatible.

Prevention versus Containment

Traditionally, our response to natural hazards has been one of prevention. If a sea wall, dunes, or levees are built to some pre-determined and calculable specifications, we believe they will prevent – or at least mitigate or reduce – inundation and destruction in a coastal zone.

Yet it is fair to ask if we understand that the design criteria used are critical to the actual success of these structures (e.g., the failure of levees after Katrina hit New Orleans) given their construction and expectations. When unexpected scenarios are encountered, or an expected scenario is more complicated than thought, the response of the “system” known as “us” (or society) to the hazard is no longer valid because basic assumptions no longer hold true.

For example, think of our daily commute: If access to a bridge, tunnel, or major highway is cut off, overflow volume is re-routed to other pieces of the transportation infrastructure that were not designed to handle the additional flow. This also works in warfare and homeland security. Thus the concept of prevention is naturally prone to failure if only the most likely possibilities are considered. This results in the implementation of mitigation strategies, whether pre-planned or “on the fly,” to resolve or contain what is viewed as short-term problems. Yet when major transportation hubs are compromised causing commercial deliveries to slow or cease, ripple effects are immediately initiated that further damage or cripple response systems (for example, gas lines).

Elusive and Illusory Control

The examples given suggest an elusive and illusory aspect of our response to natural hazards. A storm today does not elude detection thanks for constant surveillance by satellite and other platforms, and it can be anticipated based on short- and long-term atmospheric forecast models. But there remains a certain illusion (or perhaps even a self-induced deception) that this knowledge somehow will provide us with a degree of prevention or mitigation – or even a degree of invincibility.

We infer that deterministic information from a forecast (or even past experience) will allow identification of specific impacts against which we may plan and take action – not unlike interest rates or stock investments. It suggests that if we know the worth of a commodity we can reasonably expect to protect it at a certain cost. However, we live in a world of possibilities and therefore probabilities.

We know that winter will bring cold and snow or ice; summer will bring heat and humidity and tropical systems. There will be variations in the frequencies and intensities; and in some cases extreme events will take place. We tend to prepare for and anticipate the “normal” or more likely conditions – the average; or the mean conditions that tend to recur within a range of possibilities – because they occur much more frequently. Besides, why would we expend substantive efforts on or spend much revenue on a scenario that is “unlikely” based upon our own experiences or based upon climate history? Even if such a scenario took place, it might be seen as a once-in-a-

lifetime event. The cost of a battery for a smoke detector is reasonable – would you install a full fire suppression sprinkler system inside your home?

The Paradigm Shift

Two points are clear – a “science only” approach will not resolve the issue and effective strategies of response must be multimodal within a context of containment.

This presents a paradigm shift with regard to our modern society and population because of several reasons:

- we are in harm’s way
- natural hazards will continue to occur
- prevention and mitigation strategies will become more costly and be unrealistic
- complicated and unforeseen impacts and inconveniences will occur more frequently
- best practices will need to be continually adapted to meet changing demographics and demands.

This sort of multimodal approach is essential if an environmentally friendly response to natural hazards is to be effective and sustainable over the longer term. Rather than a patchwork of responses, or a retrofitting, a more robust set of solutions is needed.

This includes acknowledgement of what can or cannot be done from an economic, scientific, commercial, industrial, and demographic point of view. Indeed, determining the price of convenience, or perhaps inconvenience, requires engagement of these communities.

Attainable and Genuine Solutions

Clearly we are not dealing with a simple system composed of natural hazards, infrastructures, and communities that follow one set of rules or behave in one coordinated manner. This is no textbook figure or schematic or case study example. They act, react, and interact on multiple levels and result in positive and negative feedbacks that require further intervention. Recognizing this interdependence, we must avoid concluding that we can fix anything or devise a failsafe plan to fit any eventuality. History tells us that absolutes are unrealistic. The best viable solutions that are attainable and genuine require us to:

- Define the *acceptable working capacity and key limitations* of our existing infrastructure from a societal point of view including economics, commercial and industrial needs, and demographics as related to use and response to changes in all infrastructure occurring with natural hazards;
- Specify the *scenarios of response* of existing and future infrastructure with regard to impacts, interactions, and feedbacks between the infrastructure and recognized as well as unexpected societal responses within economic, commercial, industrial, and demographic contexts;

- Deliver *adjustable and adaptable measurements* of the viability, vulnerability, resilience, and sustainability of existing and future infrastructure for use in guiding the planning, preparation, and decision-making processes before, during, and after natural hazards

An attainable solution based on the foregoing principles is within our reach and obtainable given our knowledge, understanding, and ability to act. A genuine solution suggests that we have used factual and clear data and information to outline a true and effective framework of response that properly acknowledges realities and limitations. It helps us to better differentiate and define the following:

- Societal expectations, needs, and wants with regard to a relative inconvenience.
- Scientific expectations and realities with regard to offering “real” societal solutions.
- Economically informed, adaptable, tailored, and realistic responses to our vulnerabilities.

A New Resolve

A few specific cases can afford a clearer illustration of the principles discussed above. These include calls for a return of high impact coastal areas to nature, flood zone mapping for use in determining buyout options, and demands that a high level of protection and safety is afforded to everyone for each imaginable hazard.

In the first case the answer is a mix of avoidance and prevention that simply applies a “best practices” approach to the remediation of risks. In the case of buyouts it is about mitigation and avoidance based on past policies and experiences that may not be appropriate to the situation. In the third case it is about providing a “safe room” or failsafe strategies – one of complete prevention of impact, or one of no inconvenience or risk. Considered together, these suggest the following for new policy considerations:

- Beach *capacity* and physical *limitations* must be clearly defined within the context of economic vitality (tourism and recreation) and the local population; both as related to hazard risks and costs. This requires distinguishing the shore community (subdivided among residents, summer, and off-season temporary) from other interests. The worth and risks are not equivalent among these and it is time to stop treating them as though they were. Only in this way will it be possible to understand the complexity of impacts on the infrastructure in terms of its response to actual hazards, follow-up responses, and re-building efforts.
- Flood and hazard zone mapping for risk or abatement must consider *scenarios of response* not strictly from a statistical, storm specific, or physical point of view; but from that of competing interests and variable responses to hazards. Not all infrastructures were built at the same time nor were they engineered for the same level of response let alone the same hazards – thus individual insurability varies. Not all economic, commercial, industrial, and demographic factors – or stakeholders – have been consulted to best define how they are impacted by hazards or how they respond. These must be known to make both informed and meaningful planning and response recommendations essential to decision-making.

- Society and infrastructures are living things that have *adjustable and adaptable measurements* that tell us how they can be expected to behave in a certain manner or express specific behaviors given select situations. Yet when faced with a new situation, these living systems respond in both old and newer ways – they adjust and adapt. In the ring a fighter who does not adjust and adapt will be out of the ring in a few rounds; on the highway someone not adjusting to changing weather and road conditions will likely experience an accident. If we intend to remain viable, reduce our vulnerability, and be resilient in recovery we must stop the cookie-cutter mentality in policy response and design. We must instead build into our hazard design the flexibility available within the existing (or future) infrastructure and society to map the new ways in which it will act, respond, and interact with any hazard.

If we accept this line of reasoning, the ultimate question is one of resolve. Are we willing to do what is necessary when it requires consideration of competing interests? Do we have the capabilities and tools necessary for completion and implementation of a comprehensive and ongoing response system that can be maintained and reconsidered over time? Are we willing to do so? The answers should all be “Yes” if we are serious and want to make changes. Coupled with specific recommendations, a resolve to act upon the principles outlined here – and matched to authentic goals and realistic guidelines – we should be able to weather any storm.

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