

The Lisbon Earthquake of 1755 and Superstorm Sandy: The Need to Understand Long-Term Impacts

On 1 November 1755, when much of the population of Lisbon was in church observing All Saints Day, the city was struck by a massive earthquake, followed by a tsunami. This disaster left an estimated 40 000 to 50 000 people dead and caused severe economic damages that economists now speculate amounted to between 32% and 48% of Portugal's gross domestic product (GDP). The city of Lisbon was essentially destroyed.¹ More than 250 years later, Superstorm Sandy, also known as Hurricane Sandy, burst upon the mid-Atlantic and northeastern states on 29 October 2012. Despite advanced warnings and evacuations, the damage caused by the storm overwhelmed residents of the affected areas and left homes, infrastructure, and even institutions severely damaged. There were 131 deaths resulting from Sandy and initial estimates of the economic costs are upward of \$100 billion.

Comparing the Lisbon earthquake to Superstorm Sandy is an exercise that is obviously fraught with difficulties. One event was an earthquake and the other an extreme weather event. There are other significant differences, including the ability to predict the event and warn the population; the nature of contemporary technology, infrastructure, and the built environment; and access to resources and institutions for emergency response and later rebuilding. Yet both events were sudden, extremely destructive physical disasters that wrought unprecedented damage on a regional society and economy.

Although one cannot draw specific conclusions from the Lisbon earthquake and apply them to the aftermath of Superstorm Sandy, looking at Sandy and other contemporary extreme weather events in light of what has been learned about the long-term socioeconomic consequences of the Lisbon earthquake can still be useful. Because the Lisbon earthquake took place so long ago, we have the advantage of examining it through a different analytic perspective, a long-term perspective, that is not possible for analyzing an extreme weather event that took place weeks or even months ago. However, the decades and centuries that have passed since the Lisbon earthquake enable us to examine a broader spectrum of consequences and impacts than is possible to apply to near-term events, and this approach can be extended to analyze the interactions of weather and climate on society.

We know that the Lisbon earthquake of 1755 had a major intellectual influence in the history of Europe. In retrospect, this should not be surprising, for we also know, based on recent social science research, that individuals and societies respond more strongly to events that they have experienced directly or vicariously than they do to abstract scientific or rational exposition. The accumulated tragedies caused by the earthquake made Europeans shudder and feel vulnerable. In the decades after 1755, the world seemed much less benign to them. The earthquake influenced theologians, philosophers, dramatists and writers, politicians and statesmen, and even the fortunes of empires. Specifically, the works of Voltaire, Rousseau, Kant, and others were significantly influenced by the earthquake. It is obviously too early to determine whether Sandy will have this type of intellectual influence, but certain trends are already evident. For example, although Sandy was a weather event, there is now more widespread concern in the United States about the consequences of climate change than there was prior to 29 October 2012. Superstorm Sandy is now frequently cited as an example of the "new normal."

¹ I am indebted to the work of Alvaro S. Pereira on the socioeconomic impacts of the Lisbon earthquake of 1755.

Another set of impacts was related to the economic damages inflicted on Portugal by the earthquake. Restoration of the city's built environment and rebuilding the nation's economic institutions were immediate goals, but the extent of the damage and the disappearance during the earthquake of so much of the country's wealth from its colonial empire meant that financing these goals was difficult. In the immediate aftermath of the disaster, there were increases in the cost of materials and workers' wages for rebuilding, as there were in the aftermath of Hurricane Katrina and there have been in the aftermath of Sandy, but in Lisbon these price changes were short lived. Over longer time periods, however, significant changes took place in the country's economic institutions. The 1755 disaster provided Portugal's leadership with what Pereira calls the "opportunity to reform." The new economic institutions that emerged in subsequent decades were considerably more modern and centralized than those functioning before the earthquake.

If we are to use the Lisbon earthquake to guide our analysis of the impacts of extreme weather events today, what should we look for? First, we must not be so focused on short-term responses to the catastrophe that we ignore the beginnings of less visible long-term impacts. To the extent possible, we must maintain a focus on long-term social and institutional impacts, even if this means coming back to extreme weather events decades later to reanalyze impacts.

Second, the Lisbon earthquake had very long-term intellectual, philosophical, and even theological consequences for Europe and, by extension, North America. In future, we need to look more closely at the intellectual consequences of natural disasters, not just the physical consequences. This would include analyses of the patterns of thought and perceptions that underlie public policy and national culture and consideration of the ways that ordinary people think. Today, as in the eighteenth century, individuals filter their understanding of science—including extreme weather events and natural disasters—through religious and philosophical constructs, and we need to understand those constructs and the ways they can be altered by the experience of a disaster to understand public responses to weather and climate.

Third, we need to examine long-term changes and discontinuities in economic patterns and relationships and the ways that economic institutions, priorities, and partnerships are altered over time. Natural disasters—be they earthquakes or extreme weather events—often provoke socioeconomic evolution and change in the years following the event. Unanticipated disasters force governments and societies to respond to unique circumstances and give political and economic leaders the opportunity to initiate changes that might not be accepted by the public under ordinary circumstances. In sum, it will take time before we can understand some of the long-term interactions of weather and society, but we have learned from looking at past disasters that analyzing short-term impacts and reactions is only part of the story. Understanding the breadth and depth of long-term consequences is equally important.

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