

# Contributions

## The Lisbon earthquake of November 1, 1755: The first “modern” disaster?

*At 9:40 a.m on November 1, 1755, All Saints Day, Lisbon, Portugal was struck by an earthquake that nearly destroyed the entire city. The seism was felt in all of Western in Europe killing estimated 60,000 to 100,000 people. The epicenter was located in the Atlantic Ocean, some 200 km southwest of Cape Saint Vincent, and its magnitude was calculated at approximately 9 on the Richter scale. The event was followed by a tsunami and fires that further devastated the city.*

*This seism is regarded by some researchers as the “first modern disaster,” since it was the first catastrophe that led to the first coordinated response during search and rescue activities, as well as planned reconstruction and reinstatement efforts including measures to mitigate the destructive effects of future earthquakes. In addition, some researchers believe that the earthquake was the first event that led to the development of modern seismology*

*It is important to remember that the earthquake took place during the Age of Enlightenment, and it unsettled the trends of thoughts of intellectuals in that period. In 1747, Dennis Diderot, a famous French revolutionary philosopher, became the chief editor of the L'Encyclopédie (The Encyclopedia), and between 1751 and 1772 he published 28 volumes as a result of collaborative efforts with more than 100 intellectuals. Although the main interest of the encyclopedists focused on scientific and technological aspects, the Encyclopedia became the niche of the so-called social philosophy —theories related to social organizations, human nature, economics, politics and governance.*



## The Marquis of Pombal

During the activities following the earthquake, the actions of Sebastiao José de Carvalho e Melo, better known as the Marquis of Pombal, stood out. Acting as the Prime Minister of King Joseph of Portugal, he personally led the search and rescue efforts, and designed and implemented a reconstruction and reinstatement plan.

The beginning of the reconstruction activities overlapped with the reinstatement phase. Engineers and architects who worked with Pombal developed a grid design on a north-south axis in the Baixa neighborhood, which is close to the Tajo River. Unfortunately, Pombal's project was not continued by his successors. When the royal family fled to Brazil during Napoleon's invasion, Rio de Janeiro became the capital of the Portuguese empire, leading to Lisbon's decline of power in the empire.

Pombal not only carried out reconstruction activities. He also actively sought information in an effort to better understand the chain of events leading up to the earthquake. In fact, he sent a questionnaire to all the parishes with the following questions: How long did the earthquake? How many aftershocks were there? What type of damage was caused? Was there any unusual animal behavior preceding the event? (Pombal was far ahead to modern Chinese studies of the 1960s), What happened in the water wells?

Many of the questions that the Marquis of Pombal asked in 1755 are still used today in questionnaires applied in the aftermath of a disaster to develop isoseismic maps<sup>1</sup> (seismic intensity). Without this type of information, it would have been very difficult for modern scientists to understand the Great Lisbon Earthquake.

The Lisbon earthquake profoundly marked the European trends of thought at that time. It was heatedly discussed, perhaps for the first time, if maybe the earthquake had occurred due to natural causes, rather than divine wrath. The Church interpreted the earthquake as an act of God and announced that in the future there would be greater catastrophes as punishment of God. Thus, a controversy began which still persists to this day.

## Voltaire and Rousseau

These important thinkers of the eighteen century held an interesting epistolary debate around the meaning of the earthquake and its natural or divine origin. The following quote is from a letter sent from Rousseau to Voltaire, dated August 18, 1756. The paragraph is relevant to the modern concept of mitigation of disasters resulting from seismic events.

*Without leaving your Lisbon subject, concede, for example, that it was hardly nature that brought together twenty-thousand houses of six or seven stories (in Lisbon). If the residents of this large city had been more evenly dispersed and less densely housed, the losses would have been fewer or perhaps none at all."*

*Regarding the behavior of the population as a result of the earthquake, Rousseau asks, "How many unfortunates perished in this disaster through the desire to fetch their clothing, papers, or money?"*

## Final considerations

The Lisbon earthquake was the first disaster of natural origin for which a State accepted its responsibilities of search and rescue, as well as regarding the design and implementation of a reconstruction program. It also generated an opinion contrary to the supernatural origin of disasters in general and seismic events in particular.

The Marquis of Pombal was the first person in history to foster a scientific and objective description of the causes and consequences of an earthquake. For this reason, some consider him the predecessor of modern seismologists.

For his part, the philosopher Jean Jacques Rousseau had a futuristic vision of what we would now call "seismic micro-zoning" based on his comments on the overcrowded buildings in Lisbon and his viewpoint, also ahead of his time, on the need to prepare the population to cope with effects of seismic events.

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*The author has worked on the issue of historic seismology as a tool for preserving the historic heritage built in seismic regions. This is related to the risk management of culture heritage, included in the Hyogo Framework for Action, section 3.3.*

This article is the result of long and interesting conversations with Professor Rusel Dones who, jointly with Professor Hérnico L. Quarantelli, founded the Disaster Research Center housed at the University of Delaware.

Professor Dynes has written a number of comprehensive documents about the 1755 Lisbon earthquake, also known as the Great Lisbon Earthquake. This article is also based on his research papers.

<sup>1</sup> A way to represent graphically the intensity levels of an earthquake shock is through isoseismic maps, which include curves that connect points with equal intensity levels of a particular event. These maps use the Mercalli Modified Scale.





## Risk management: A development issue

**D**ue to the existing reality and the issues related to facing disasters and emergencies in Latin American and Caribbean countries, it is imperative to place emphasis on risk management through the efficient use of academic, technological, socio-natural and environmental resources, with one sole purpose: to further development.

Understanding and analyzing disaster-related issues from an interdisciplinary perspective contributes to improving risk management. Although on occasions these might appear different from economic issues, it is however possible to address both through the application of adequate instruments.

Risk management has become increasingly important in the region —where resilience to disasters is a common factor. This is demonstrated by State policies relating to disaster preparedness and response that are being applied in countries throughout Latin America and the Caribbean.

This ongoing work can be seen as part of the activities proposed by the Hyogo Framework for Action 2005-2015, as well as by the program titled “Disaster Prevention in the Andean Community of Nations” (PREDECAN), the Coordination Center for Natural Disaster Prevention in Central America (CEPREDENAC), the Pan-American Health Organization (PAHO-WHO), and the International Federation of Red Cross and Red Crescent Societies (IFRC); the technical support provided by the United Nations International Strategy for Disaster Reduction (UN/ISDR), and the work carried out by the Regional Disaster Information Center (CRID), NGOs, consultants and advisors in risk management and local emergency response groups, such as the Red Cross, volunteer firefighters, brigades and municipal governments.

Risk management requires the willingness and ability of highly committed and trained professionals who have the knowledge necessary to propose solutions and regulations. It also requires research and the application of innovative responses to address increasingly important issues. In order to incorporate spatial and temporal dimensions into risk management, it is also necessary to apply an interdisciplinary approach. In the last few years, regional and global interest in this issue has grown significantly.

Risk management must be regarded as an integral and comprehensive component of global, sectoral, territorial, urban, local, community, or family development processes, in search of sustainability.

Actions and instruments that promote development must also advance safety and risk reduction. Risk management is a cross-cutting approach and a practice that should play a part in all human processes and activities.

The ultimate goal of risk management is to ensure that development takes place in the best possible conditions for safety, and that actions aimed at responding to disasters also promote development.

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## Social communication in risk management: Concepts to be remembered and applied

- Communication management gives “value” to risk management; it stimulates, promotes, influences, persuades and facilitates understanding, and modifies behaviors and attitudes.
- Communication is often confused with information. However, it is important to bear in mind that communication is an “essential process” in any prevention or response action, and in the planning of post-disaster reconstruction or reinstatement processes. Communication provides basic inputs so that both the speaker and the recipient of messages can relate to each other appropriately, interact proactively and establish an optimal feedback channel.
- Currently, the vast influx of data that any person or institution can manage is of such a volume that it is necessary to rate the information or establish hierarchies so that data is transformed into effective communication.

Organizations have a number of communication instruments that must be used tactically. Generally, when information is confused with communication, these instruments do not allow us to have a positive impact on behaviors and attitudes. For this reason, it is necessary to design communication plans and programs that establish actions in the short, medium and long terms. During times of emergency or disaster preparedness, as well in prevention, mitigation, and response in the community, the strategic application of communication instruments allow us to better issue messages intended for different target groups.

- In principle, when referring to communications of risk, we also allude to information and dissemination as part of the process, which is composed of:
  1. An explanation of the origin of the hazard, as well as of prevention and preparedness.
  2. A description of the different levels of vulnerability and various ways to reduce it.

When generating messages intended for the population at large, for instance, basic information must include how the combination of these two elements may lead to risk situations. Then, communication will address prevention issues or an emergency, depending on its purpose and timeliness within the actions carried out when risks take place.

- If we base our actions on documents of global consensus, such as the Hyogo Framework for Action or the Millennium Development Goals, we will have to foster, through social communication, the dissemination of tools that allow us to understand how to reduce our own vulnerabilities. In this way, risk communication would be the confluence or the synthesis of information on dangers or hazards and information on the characteristics of existing vulnerabilities.

Thus, we can infer that social communications surrounding risk have two different implementation “moments,” within the public and private sectors working on disaster prevention and response:

- a) *When raising awareness among society so that it perceives its own vulnerability to certain hazards and discovers its strengths to reduce their consequences; and*
- b) *When promoting actions aimed at reducing vulnerability, so that the population is prepared to face any event that could become a disaster.*

To communicate is intrinsic to every human being. In the case of risk management, we must do so with clearness, opportunity, adaptability, effectiveness and precision. This is why communication management is essential.

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