

Preface

Earthquakes are common phenomena that since time immemorial have been permanent threats and challenge for the human being. The violent movement at the Earth's surface induced by the seismic waves deeply marked the humanity consciousness, as demonstrated by abundant folklore of legends, proverbs and taboos. Some of large earthquakes deeply marked the course of humankind, in such a degree that led to the disappearance of civilizations.

People are becoming progressively more vulnerable to disasters of all types, including earthquakes, and this is true in case of both poor and rich countries (Hurricane Katrina and Fukushima nuclear disaster are typical examples in two of the topmost developed countries).

Natural hazards are unavoidable, but they do not necessarily become natural disasters. The critical issue put up to society nowadays is the tremendous increase of the vulnerability of human communities and infrastructures. If any previous major event happened today, it would cause much more consequences than it did at the time. This is a direct consequence of a rapid urbanization process, a tremendous increase of population and infrastructure, economic developments, expansion of real-time communication, industrial interdependence that make the system more sensitive to earthquake impact. The most affected communities and regions are those where no proper planning and environmental practices were implemented.

Intensive risk is mainly a characteristic of large cities or densely populated areas where the level of vulnerability to natural hazards has increased rapidly. For this reason, disaster management has assumed great importance in recent times. Repeatedly warning signs appear worldwide: the devastating earthquakes occurred within the past years (Indonesia, Kashmir, Sichuan, Haiti, Japan) are some of the most costly (both in terms of human lives and economic loss) natural disasters in human history.

Let us take a single example: the tragic consequences of poor local housing infrastructure (particularly schools and hospitals). The tremor with magnitude 6.9 that took place on December 7, 1988 at 11:41 local time (07:41 UTC) in the Spitak region of Armenia killed at least 25,000 people. It has been estimated that if the earthquake had occurred 5 min later, the number of deaths would have been considerably diminished, because the children would have left the schools' unstable buildings. During the earthquake that hit the Pakistan on the 8th of October 2005 ($M_w = 7.6$) about 7669 schools collapsed during morning classes and about 18,095 students and 853

teachers and educational staff died then (Source: Asian Development Bank and World Bank, 2005). Another tragic case was reported on May 12, 2008 in Sichuan (China) when during an earthquake of magnitude 7.9 over 7,000 inadequately engineered schoolrooms collapsed.

The main topic of the present book refers to the role of urban planning in earthquake disaster management, as one of the crucial elements determining the vulnerability level to earthquakes. However, this approach is often neglected in earthquake risk mitigation strategies and preventing measures. The new point of view is to transfer the focus from building scale to city scale. This broader view implies mechanisms that are interdisciplinary, with public, private and civil society participation involving all concerned entities within an urban area.

Lack of control and planning in urbanization can have tragic consequences. Demographic pressure (due to the inflow of rural population to the larger cities) results in poorly developed shanty-towns in marginal and risky areas and development of illegal, uncontrolled and unplanned urban infrastructure.

Social and environmental factors can contribute also to vulnerability. Frequently, the socially disadvantaged population has to use short-term survival strategies without any long-term prospect or investment. Since individuals in the dense populated city become more and more dependent on the system, real psychological traumas can be induced in large portions of population by system disruptions.

Disaster risk comprises different types of potential losses which are often difficult to quantify. Thus, each destroying earthquake brings into our attention the vulnerabilities, defects and critical points in our system facing the seismic wave impact. Experience from passed events shows that although earthquakes can lead to enormous toll in human lives and cause billions of dollars of damage to property, infrastructure and services, many of the catastrophic consequences of these earthquakes were preventable. Taking into account the fact that such events are rare (at local scale at least), it is essential to consider the lessons learned from previous disasters, and take advantage of this information in order to incorporate adequate preventive measures to reduce the vulnerability to similar phenomena in the future.

At the same time, in dealing with disasters, administration cannot rely on normal procedures to implement appropriate responses since disasters are non-routine events that require non-routine response. Thus, the recommendations are to appeal to multihazard approaches, interdisciplinarity and multicriteria decision making in order to reach considerable disaster risk reduction.

The editors have taken care to bring together new approaches in all the principal aspects of the earthquake risk management: vulnerability, planning, risk assessment and recovery. Case studies, mostly from Italy and Romania, are investigated and innovative methodologies and current challenges and recommendations are found particularly useful for further research from the papers' presentation.

Finally, I appreciate this book as an important step forward in providing knowledge and tools to enhance society capacity to cope with disasters, to handle the situations of crisis, to promote a culture of earthquake safety and prevention.

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Editors' Note

The idea of this book grew out of a long term collaboration between the editors, at the World Housing Encyclopedia, at some project proposals, and respectively at two nationally funded projects in Romania “Multihazard and vulnerability in the seismic context of the city of Bucharest” and “Spatial and temporal patterns of urban vulnerability”, with which it adhered to the TU0801 and IS1104 COST actions, as well as common organisation of sessions from the series “Natural Hazards’ Impact on urban areas and infrastructure” (the series continues with different conveners). Funding came also from the Marie Curie European Reintegration Grant PIANO “The innovation in the plan of the current floor: Zoning in blocks of flats for the middle class in the first half of the 20th century”.

This first volume focuses on earthquake hazards, with some papers on the general problem, while a second volume is envisaged for hazards related to water.

The volume is focused mainly on Romania and Italy, where the editors are based, and reflects also the Marie Curie Actions funded mobility of the main editor.

We would like to acknowledge the following reviewers:

Marco Mucciarelli, Antonino Marvuglia, Nicolas Lachance-Bernard, Ioan Ianos, M. A. Grado-Caffaro, Ioan Sorin Borgia, Rohit Jigyasu, Sergiu Petrea, Andreea Duțu, Bogdan Srdanovic, Sonia Giovanazzi, Alex Barbat, Stefan Shanov, Dumitru Stanica, Jose Antonio Puppim de Oliveira, Meine Pieter van Dijk, Michael Wurm, Derya Maktav, Ioana Siminea, Sever Georgescu, Radu Andrei.

We also wish to express thanks for the publishing assistance of the series editor, Prof. Thomas Birkland, of the publishing editors Tamara Welschot and Fritz Schmul and of the editorial assistant Judith Terpos, for kind guidance and patience during the long production time of this volume.

Bucharest, July 2012

<http://www.springer.com/978-94-007-7980-8>

Earthquake Hazard Impact and Urban Planning

Bostenaru Dan, M.; Armas, I.; Goretti, A. (Eds.)

2014, XIII, 313 p. 155 illus., 100 illus. in color.,

Hardcover

ISBN: 978-94-007-7980-8