

Chapter 7

Resilience and Sustainability in Relation to Disasters: A Challenge for Future Cities: Common Vision and Recommendations

Gaetano Manfredi, Adam Rose, Kalliopi Sapountzaki, Gertrud Jørgensen, Edith Callaghan, Graham Tobin, Paolo Gasparini and Domenico Asprone

Urban areas, especially the growing number of mega-cities, are connected by a dense and complex web of relationships and represent the heart and engine of the global development of contemporary society. But at the same time, cities are increasingly vulnerable. Catastrophic natural events can bring down cities and the network of relationships that take place in them. Natural events as extreme weather events (recently more frequent and intense as a result of the ongoing climate

G. Manfredi · D. Asprone (✉)
University of Naples “Federico II”, Naples, Italy
e-mail: d.asprone@unina.it

G. Manfredi
e-mail: gamanfre@unina.it

A. Rose
University of South California, Los Angeles, CA, USA
e-mail: Adam.Rose@usc.edu

K. Sapountzaki
Harokopio University of Athens, Athens, Greece
e-mail: sapountzaki@hua.gr

G. Jørgensen
University of Copenhagen, Copenhagen, Denmark
e-mail: gej@life.ku.dk

E. Callaghan
Acadia University, Wolfville, Canada
e-mail: pabela@acadiau.ca; edith.callaghan@acadiau.ca

G. Tobin
University of South Florida, Tampa, FL, USA
e-mail: gtobin@usf.edu

P. Gasparini
University of Naples “Federico II”, AMRA, Naples, Italy
e-mail: paolo.gasparini@na.infn.it

changes), earthquakes, tsunamis or human-induced events such as terrorist attacks or accidents, can have extreme effects on cities and communities.

City transformation processes must be rethought, to mitigate the effects of adverse events on the vital functions of cities and communities. Redundancy and robustness of the components of the urban fabric are essential to restore the full efficiency of the city vital functions after an adverse event has taken place. Hence, resilience in the short-run is necessary to ensure sustainability in the long-run.

Disaster resilience is the process by which *communities effectively, efficiently, and equitably* implement their *capacity* to *absorb* negative impacts through *mitigation*, including *real time warning*, and to *respond* and *adapt* afterward so as to *maintain function* and *hasten recovery*, as well as to be in a better position to reduce losses from *future disasters*.

The participants to the networking event offer the following recommendations:

- To promote resilience it is necessary to consider vulnerability of complex interconnected systems, including institutions, individuals and physical systems.
- Resilience should be continuously re-evaluated because vulnerability and risk have dynamic properties.
- To promote resilience it is necessary to consider all hazards encountered including extreme events, local impact of global hazards, and chronic damaging processes.
- Resilience must be integrated into sectoral policies and governance systems, including the removal of legal and regulatory obstacles.
- Resilience should be pursued through an integrated multi-scale approach both for communities and physical systems.
- Resilience should be pursued taking into account local culture, resources, built and natural environment and socioeconomic conditions.
- Disaster risk knowledge should be increased, as should the awareness and responsibility of how individuals and communities can contribute to resilience.
- For effective risk management it is necessary to have community and individual participation.
- Resilience should be designed to be consistent with principles of social and environmental justice.
- Develop and implement improved quantitative and qualitative methods to measure and assess resilience for decision making, including consideration of uncertainties.
- Take advantage of all available technologies including social network systems and other low cost individual-based technologies.
- Take advantage of low-cost resilience tactics, at the individual business and household level, such as conservation of critical inputs, stockpiles, back-up equipment.

- Take advantage of formal and informal markets as potential sources of inherent resilience because they can provide signals of the value of remaining resources for efficient reallocation.
- Resilience can be strengthened by diversifying the supply chain.
- Successful local resilience experiences should be transformed into long-run adaptive practices.