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Robert Olshansky is professor and head of the Department of Urban and Regional Planning at the University of Illinois at Urbana-Champaign. His teaching and research cover land use and environmental planning, with an emphasis on planning for natural hazards. He has published extensively on post-disaster recovery planning, planning and policy for earthquake risks, hillside planning and landslide policy, and environmental impact assessment.

Over the years, Laurie and Rob have coauthored several publications, including *Opportunity in Chaos: Rebuilding After the 1994 Northridge and 1995 Kobe Earthquakes* and *Clear as Mud: Planning for the Rebuilding of New Orleans*. In this article, they discuss their collaboration and their work on a forthcoming Lincoln Institute book and Policy Focus Report, *After Great Disasters: How Six Countries Managed Community Recovery*.

50 Years of Disaster Recovery Planning

LAND LINES: Together, the two of you have more than 50 years of experience working in the field of disaster recovery planning. What led each of you into this specialty?

ROBERT OLSHANSKY: I have always been interested in the urban planning aspects of disasters—how to design cities to coexist with these forces, how to be more strategic and pragmatic in creating policies to reduce risks, and how to respond appropriately to natural events when they occur. But up until the mid-1990s, my focus was always on pre-disaster planning and policy.

All that changed after the twin January 17 earthquakes, in 1994 in Northridge, California, and in 1995 in Kobe, Japan. I was closely observing the recovery process in Los Angeles, when, on the first anniversary of the Northridge disaster, the Kobe earthquake provided a glimpse of what a truly large event could do to a modern urban area. A month later, I ran into Laurie Johnson at a conference, where we discovered common interests in learning from these two events, and my path was set.

I soon realized that recovery is, paradoxically, the most effective path for long-term hazard mitigation, because disasters increase awareness of natural forces and bring resources to bear on the problem. I also discovered that disasters provide planners with unusual opportunities for urban betterment. Conversely, if we are not prepared for these opportunities, we might find ourselves stuck with our new mistakes for years. As a planner, I see recovery as one of our profession's greatest challenges. It encompasses all the multidisciplinary complexities of our field, and provides some of our greatest opportunities to right past wrongs. But the process transpires in a compressed time frame amid considerable tensions and frustration, which makes it particu-

larly hard to manage. Each new recovery situation is a multifaceted case study of its own.

LAURIE JOHNSON: Before Rob and I began collaborating, I studied geophysics and then urban planning. Shortly after graduation in 1988, I moved to the San Francisco Bay Area to work for William Spangle and George Mader, pioneers in land use planning for geologically hazardous areas. When the Loma Prieta earthquake struck in 1989, we became more actively engaged with Bay Area cities on post-disaster recovery and rebuilding issues.

With support from the National Science Foundation, we hosted one of the first-of-its-kind conferences on rebuilding after earthquakes, at Stanford University in 1990. Planners from cities prone to earthquakes across the United States came to learn from planners who led rebuilding efforts following some of the world's major urban earthquakes, in Skopje, Macedonia (then Yugoslavia, 1963); Managua, Nicaragua (1972); Friuli, Italy (1976); El Asnam, Algeria (1980); Mexico City (1985); and Armenia (1988). It was in those years that I became interested in rebuilding communities—and particularly in enhancing local government capacity to manage and lead post-disaster recovery.

LL: Laurie, you have a doctorate degree in informatics from Kyoto University. Why did you decide to go there to study?

LJ: I had tried to start work on a doctorate a couple of times earlier in my career, but in 2006 the stars finally aligned when Professor Haruo Hayashi invited me to join his disaster research center at Kyoto University. I was delayed again when I went to work on the post-Katrina recovery plan in 2006–2007. But it turned out that the New Orleans recovery experience offered an opportunity for a richer exchange with Japanese colleagues who had been deeply involved in Kobe's recovery. I initially hoped to compare the U.S. and Japanese approaches to large-scale disaster recovery management for my dissertation, but eventually settled on doing



Fires blaze in Kobe on the morning of the earthquake on January 17, 1995. Credit: Ikuo Kobayashi.

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a comparative analysis of recovery management in three U.S. cities: Grand Forks, North Dakota; Los Angeles, California; and New Orleans, Louisiana. I really valued the opportunity to reflect on the U.S. approaches with my Japanese colleagues, who, coming from a different governance system, helped me to see many elements of conflicting policy and gaps that I may not have appreciated otherwise.

LL: Rob, after Hurricane Katrina, you and Timothy Green conducted research for the Lincoln Institute on the Road Home Program, which dispensed more than \$8 billion to New Orleans home owners to either repair their homes or sell them to the state. You found that residents in the worst-flooded areas were most likely to move away (see Green and Olshansky, "Homeowner Decisions, Land Banking, and Land Use Change in New Orleans after Hurricane Katrina," 2009). Do you know if that pattern, which suggests a very rational response to risk, has held up over time?

RO: We did find that flood depth was the variable most correlated with the decision to sell and move. Home value, income, race, and years of occupancy were not significant factors, at least at the scale of our data. This is a positive finding in terms of flood policy, and it is certainly better than finding that flood depth had no effect at all on home owner behavior. But whether actual reconstruction patterns have changed is unclear, because the data are simply not available. Visually, however, the parts of the city with the least rebuilding are generally at the lowest elevations, where the most damage occurred. So, yes, this does appear to reflect a rational response to flood risk.

relocation strategies aimed at avoiding repeated catastrophic losses?

LJ: In the United States, the practice of post-disaster floodplain buyouts is fairly well established. Voluntary buyout programs typically target single-family homes that are more than 50 percent damaged by flood or within the Federal Emergency Management Agency's 100-year flood zone. But federal post-disaster funding streams, like FEMA's hazard mitigation grant program, also require that the buyout areas remain as open space or have some other nonoccupied use. Thus, if flooded communities have few available houses or infill opportunities, both rental and for-sale housing prices in the area may rise sharply and residents may decide to move away, creating a drag on local economies.

By their very nature, large disasters disrupt the physical, social, economic, and institutional systems of the communities affected. A major buyout program can create another wave of disruption that ripples through all these systems if it's not designed and managed properly. In normal times, these systems are not as stressed or tightly coupled, so the disruption caused by a land redevelopment or retreat project is typically not as acute as in post-disaster times.

Grand Forks, North Dakota, provides one of the better examples of comprehensive recovery planning and stewardship of both people and place. After the 1997 flood, the city worked with federal and state partners and the private sector to acquire land and install infrastructure and services for a new residential neighborhood on higher ground, and they gave priority to the buyout property owners to relocate there. This helped to keep residents in the community and stabilize housing prices. Grand Forks also partnered with its neighbor, East Grand Forks, Minnesota, as well as federal and state agencies, to aggregate more than 2,200 acres of land obtained through the buyouts and levee protection projects. Subsequent construction of a permanent greenway along the Red River has helped change the downtowns of both cities and their economies for the better. But I should emphasize that this

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But the reasons for that response may vary among different income groups. I suspect that many low-lying lots in the wealthier areas were subsequently acquired by buyers who built homes on them, whereas many lower-income owners who intended to rebuild were not financially able to do so. So the assertion that most people behaved "rationally" in the face of flood risk needs to be seen in a broader context. Furthermore, although flood depth was positively correlated with the decision to sell, the majority of home owners in the most flooded parts of the city—52 to 79 percent, depending on location—still opted to stay and rebuild.

LL: What are the challenges faced by buyout programs like the Road Home Program and other



This neighborhood park, created through a large-scale land readjustment project in the Rokkomichi district of eastern Kobe, includes a community meeting center stocked with disaster supplies. Credit: Laurie Johnson.

transformation was by no means easy. It took over a decade to accomplish, requiring sustained leadership, collaboration, and support.

LL: Laurie and Rob, the Lincoln Institute has been concerned for some years with two global forces: climate change and urbanization. Are climate events and urban development in hazardous locations likely to increase exposure to disasters? Are we prepared to deal with this?

RO: Disasters, particularly in coastal areas, are a significant international problem right now, regardless of these driving forces. This is a present-day problem, not a future problem. Many of the world's most populated cities are ports on river deltas or estuaries, and many parts of these cities are below sea level. Many people also live on coastal barrier islands. Large storms strike each of these coastal areas several times each century, and after each storm we learn important lessons that we quickly forget. Meanwhile, cities worldwide are growing through both population growth and increasing urbanization. This makes the problem worse because more people are exposed, much of the urban growth occurs in the

lowest places, and rapid, dense construction in many cities is of low quality. Although climate change exacerbates all of this, I would use climate change as the exclamation point to this argument rather than its starting point. So no, most places are not well prepared for either present-day storms or for the elevated number of coastal storm surges expected in the future.

LL: The two of you have just finished work on a major research project for Lincoln based on case studies of disaster recovery in six countries. Tell us about the cases you selected and why you chose them.

RO: We focused on recovery efforts in China, India, Indonesia, Japan, New Zealand, and the United States. The common thread is that these were extremely large disasters that severely affected urban areas, and they offer lessons that are relevant for other countries, particularly the United States. With the exception of China, the countries we focused on have democratic institutions, in which a variety of governmental

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and nongovernmental organizations participate in carrying out recovery. I was especially interested in cases of relocation, which are always difficult to accomplish in democratic societies. We chose the 2001 Gujarat earthquake in India both because of the land readjustment process and because of the widespread damage in rural areas similar in scale to the central United States. India is also of interest because its

history of disasters illustrates a process of policy learning over time in a large and hazard-prone country. Indonesia is of interest for the same reason—it is probably the best example of rapid evolution of policy and practice as a result of learning from multiple disasters. In addition, the 2004 earthquake and tsunami in Banda Aceh, occurring in the midst of armed conflict, is one of the greatest disasters in modern history. At the time it occurred, we decided to investigate the Indian Ocean tsunami, because it provided an opportunity to view recovery efforts taking place simultaneously in several countries. In China, we were drawn to the immense scale of the 2008 earthquake in Sichuan Province and its relationship to ongoing processes of urbanization and land use change.

Bhuj's old walled city, devastated by the 2001 earthquake in the state of Gujarat, India, was reconstructed following a comprehensive planning and land readjustment process. Although the old center is less dense, it is still a vibrant urban area, and it is safer than before. Credit: Robert Olshansky.



Robert Olshansky and Laurie Johnson enjoy a moment of calm before the next storm, in 2014. Photo courtesy of the authors.

LJ: Rob and I had already written extensively about post-disaster recovery planning in many U.S. and Japanese cities. So, for this book, we decided to take a longer view of both countries' approaches to recovery management. In the United States, we look at the evolution of recovery policy following the World Trade Center attacks, Hurricane Katrina, and Hurricane Sandy—all of which involved considerable federal funding and a centralization of federal and state authority. For Japan, we look briefly at the rebuilding of Tokyo after the devastating earthquake and fire of 1923, which made an indelible mark on the country's disaster management philosophy and policy, and how that experience influenced the government's approach to funding and managing recovery from the 1995 earthquake and the 2011 earthquake and tsunami.

Our book also includes a look at disaster recovery in Christchurch, New Zealand, following the devastating sequence of earthquakes in 2010–2011 that caused repeated and widespread liquefaction, rockfalls, and ground subsidence.

Researching this case study brought me back to my original professional passion: land use planning approaches in geologically hazardous areas. New Zealand's government has taken a very active leadership role in the recovery, which provides a very good case for comparison with other national approaches that we describe.

LL: Drawing on these case studies, what are some of the key things planners and policy makers can do to better prepare for recovery after disaster strikes?

RO: In each of the cases, governments faced considerable uncertainty and had to balance the tensions between quickly restoring what was there before and deliberately creating betterment. Planners and policy makers need to reduce this uncertainty by finding funds, establishing clear procedures, streamlining bureaucratic processes, providing public information, and involving all stakeholders so that they can help inform good decision making and policy design. We provide several recommendations in the book that reflect a common set of principles: primacy of information, stakeholder involvement, and transparency.

LJ: Recovery after a major disaster is always complex and never fast enough for affected residents. However, the process can be improved by setting realistic expectations at the outset and by working to restore communities and economies quickly and equitably, empowering the full range of stakeholders—residents, businesses, land owners, insurers, utilities, and others—to participate in the process. In this way, governments can resolve preexisting problems, ensure governance for recovery over the long term, and reduce the risk of future disasters.

RO: Even better than smart recovery, however, is thinking ahead about strategies to manage future disasters. This is a good way to improve community resilience—the ability to survive, adapt, and recover from extreme events. □