Mexico Observes 20th Anniversary of Devastating Earthquake

LADB Staff
Scientists and disaster-assistance experts are growing increasingly concerned about Mexico City's vulnerability to another major earthquake similar to the one that leveled large portions of the Mexican capital in 1985. The earthquake that struck the capital on Sept. 19, 1985, measured 8.1 on the Richter scale, and scientists and government officials see the possibility that a temblor of similar magnitude will strike the capital again. "The main problem is that Mexico City is located in the middle of a semicircle of seismic activity that runs from Puerto Vallarta [Jalisco state] to Tehuantepec [Oaxaca state]," said Cinna Lomnitz, a veteran researcher at the Instituto de Geofisica at the Universidad Nacional Autonoma de Mexico (UNAM). "Any tremors that originate within this area will always affect the capital."

A UNAM report shows the 1985 earthquake was felt in a wide area outside the capital, particularly in Jalisco state. The temblor caused major damage in communities like Ciudad Guzman, Jalisco, but the problems were magnified in Mexico City, where a dense population and the prevalence of large and unstable buildings resulted in a major disaster.

The 8.1 earthquake was followed by an aftershock measuring 7.5 on the Richter scale. Mexico City vulnerable to another major earthquake Maria del Carmen Segura Rangel, director of the civil protection division at the Secretaria de Gobernacion (SEGOB), said the federal government is anticipating the possibility that another major earthquake will strike western and central Mexico in the next 10 years, placing at risk more than 32 million residents.

Government statistics indicate that the 1985 earthquake claimed 4,500 lives, but most unofficial sources suggest the death toll might have climbed to 10,000, and some reports put the death toll as high as 30,000.

Lomnitz said the geological composition of Mexico City increases its risk because the capital was built on a flat, unstable lakebed. The layer of sediment under the city, said the researcher, amplifies any major temblors. "This layer acts as a giant antenna, where everything constructed upon it runs the risk of falling," Lomnitz told the Mexico City daily newspaper La Cronica de Hoy. Mexico City has suffered two other major earthquakes in the past 50 years. In 1957, an earthquake measuring 7.7 on the Richter scale knocked the famous El Angel de la Independencia statue from its perch. The epicenter of that earthquake was located in Guerrero state, near Acapulco.

In 1979, an earthquake centered near Petatlan, also in Guerrero state, caused major damage to the Universidad Iberoamericana in Mexico City. That earthquake measured 7.6 on the Richter scale. The capital escaped major damage during an earthquake centered in Colima state in January 2003. That temblor measured 7.6 on the Richter scale.
Authorities may not be ready to deal with catastrophe

Even though city, state, and federal authorities are aware of the possibility of a damaging earthquake, experts are concerned that the government has not done enough to prepare for such an eventuality. For example, said UNAM engineering expert Sergio Alcocer Martinez de Castro, the government has failed to allocate sufficient funds to adequately maintain its early-warning system. Because of a funding shortfall, only one-fourth of the 400 earthquake sensors in Mexico are currently in operation, said Alcocer Martinez.

Other experts point to the lack of personnel both for the preventative stages and for the disaster-rescue phases. UNAM experts say that earthquake-prone countries like China and Japan have poured considerably more resources into seismic studies than Mexico. For example, there are 15,000 earthquake experts in China and 4,000 in Japan, compared with 20 in Mexico. The Chinese government is spending US$400 million in seismic instrumentation, said a member of the Academia Mexicana de Ciencias.

In contrast, Mexico approved US$4 million for earthquake-monitoring equipment six years ago, but very little new funds have been allocated since that time. To make matters worse, none of the equipment acquired with that allocation has been installed because of excessive red tape. "Our disaster-prevention plan is not as efficient as we'd like because we have an excessively bureaucratic system," said Lomnitz. The number of public-safety personnel trained to respond to emergencies is also woefully inadequate in Mexico City.

Even though the Mexican capital has roughly the same population as New York City, there are 1,300 firefighters at 12 stations in Mexico City, compared with 11,000 firefighters at 238 sites in New York, local officials told the Mexico City English-language daily newspaper The Herald.

For authorities in Mexico City, the biggest problem is the existence of tens of thousands of private dwellings constructed on land that has not been surveyed or properly inspected. Often, these homes are built by impoverished residents. Each borough [delegacion] is responsible for building inspections, but authorities often look the other way or fail to properly enforce building codes, which were strengthened after the 1985 earthquake.

"The problem is what we don't know," said Rodolfo de la Torre, an expert on poverty at the Universidad Iberoamericana in Mexico City. "Earthquakes not only generate tragedy but also information. And more information about where the weakest areas of the city are may have to be revealed through another earthquake."

Inconsistent enforcement of building codes

The inconsistent enforcement of city codes has put many neighborhoods at risk. A recent report from UNAM's Servicio Geologico Metropolitano (SGM) indicates that as many as 1 million buildings in the Mexican capital could be at risk from an earthquake.

Sergio Anibal Martinez, who heads the inspection department at one of the Mexico City boroughs, said the same contractors who built the shoddy homes that tumbled during the 1985 earthquake are
responsible for the poor-quality replacement homes built in the damaged neighborhoods. "None of these people had to face a trial or a jail sentence for having constructed a poor-quality dwelling or for ignoring construction codes," Martinez told the Mexico City daily political newspaper La Crisis.

Another problem is that the mostly poor residents of the risky dwellings have nowhere to go if they are forced to abandon their homes. Mexico City officials drew some parallels to Hurricane Katrina in New Orleans in early September 2005, where the lower-income residents suffered most. "That the poor were the ones that couldn't evacuate [from New Orleans] is something that caught our attention because the buildings that were in bad shape in 1985 were for the people of lower economic means," said Luis Wintergerst, director of civil protection for Mexico City.

Mexican soldiers helped with some of the relief operations for Katrina (see SourceMex, 2005-09-14). Mexico also offered US authorities the use of its elite search-and-rescue team known as the Topos, created in the aftermath of the 1985 earthquake.

Critics say authorities have not done enough to identify all the vulnerable areas of the city. "The Mexico City government needs to conduct a more comprehensive survey to identify all the areas of risk," said federal Deputy Francisco Agundis Arias, a member of the Partido Verde Ecologista Mexicano (PVEM).

The Mexico City government has twice upgraded the construction codes since 1985, creating a set of norms for all private and public buildings. The stricter construction codes will reduce the chance of catastrophe in the larger buildings. For example, newer buildings such as the 55-story Torre Mayor have foundations that extend 85 meters underground and include 98 giant shock absorbers. Even with the stricter codes and state-of-the-art construction methods, some specialists are concerned that many high-rise buildings are going up in some of the more vulnerable sections of the city. "The land is more valuable in the center of the city, and therefore it is logical that this is where construction is taking place," said Lomnitz.

**Seismic Alarm System in place**

In addition to the stricter building codes, local and federal officials point to mechanisms they have implemented to better respond to a disaster, including the creation of a rapid-response team. Authorities have installed a Seismic Alarm System (SAS), which gives a 60-second advance warning to disaster coordinators and mobilizes police and firefighters, the Mexico City civil protection department, the Red Cross, and federal agencies like the Secretaria de Defensa Nacional (SEDENA), a network of organized volunteers.

The SAS, which relies on data from seismic-detection stations along the coast of Guerrero state, is designed to put response teams in motion before the earthquake creates communications or logistical problems. The SAS has been successfully tested with several tremors measuring 6.0 on the Richter scale. "As helpful as the SAS can be, there are some obvious limitations to the system," said Kelly Arthur Garrett, a columnist for The Herald. "First, of course, is that it only works for temblors coming from the Guerrero coast. A killer quake from the waters off Michoacan would hit the Valley of Mexico with no warning."
Garrett noted that a plan is in the works to install detection stations along Michoacan in the near future. The requests to expand the SAS system coincide with calls from the scientific community for Mexico to improve its monitoring capabilities to better detect the threat of a tsunami along the Mexican Pacific Coast. Increased concerns about a tsunami arose in the wake of the tsunami that killed hundreds of thousands of people in eleven countries along the Indian Ocean in December 2004 (see SourceMex, 2005-01-19).

The possibility of an earthquake led authorities in Mexico City and Queretaro, Morelos, Guerrero, Jalisco, and Baja California states to hold evacuation drills on civil-protection day (Dia Nacional de Proteccion Civil), which falls on Sept. 19, the anniversary of the 1985 earthquake. Schools, businesses, and government agencies participated in the drills.

**Government may issue catastrophe bond**

The Mexican federal government, meanwhile, is considering issuing a special catastrophe bond (CatBond) worth US$450 million to cover the country financially in case of a major earthquake. Mexico ranks sixth in the world in seismic activity and is considered among the countries most at risk for a major earthquake. The catastrophe bond would only cover the three most-populated regions in the Pacific, including the Mexican capital, which could suffer extensive damage from an earthquake.

Additionally, payment would not apply unless damage occurred from an earthquake of 7.5 or greater on the Richter scale in Mexico City and 8.0 in other areas. "If we suffer an earthquake of 8.3 on the Richter scale, the Mexican government would be eligible to submit a claim," said Jose Antonio Gonzalez Anaya, director of insurance and securities at the Secretaria de Hacienda y Credito Publico (SHCP).

CatBonds, in existence since 1997, have been used to cover damages caused by earthquakes and hurricanes in the US, typhoons and earthquakes in Japan, and windstorms in Europe. "Mexico would be one of the first in Latin America to acquire such a bond," said Gonzalez Anaya.

The money to be paid to Mexico in case of an earthquake would be held in a trust fund containing liquid and safe securities, such as US Treasury bonds. The government would pay a risk premium that investors would collect on top of the rate on the instruments. "It's the perfect instrument because these things happen independently of how the economy is doing, so institutional investors are increasingly putting money into them," Gonzalez Anaya told the Spanish news service EFE.

**1985 earthquake fostered political, social changes in capital**

Political analysts say the 1985 earthquake may have been largely responsible for shaking up politics in the Mexican capital, with many residents blaming a slow response by the administration of former President Miguel de la Madrid (1982-1988) and the Partido Revolucionario Institucional (PRI), which also governed Mexico City at that time.

"President Miguel de la Madrid was largely invisible during the first days after the quake, spawning rumors that he had suffered a nervous breakdown," said Jonathan Clark of The Herald. "When he did speak publicly, it was often in an effort to minimize the damage." To make matters worse, de la
Madrid initially rebuffed offers of international aid because of concern that this would jeopardize his administration's efforts to renegotiate the country's foreign debt.

"The true colors of the PRI and its real priorities, which were oriented toward the economy and the wealthy rather than average citizens, came forward [after the earthquake]," said Diane Davis, professor of political sociology at the Massachusetts Institute of Technology (MIT) and author of Urban Leviathan: Mexico City in the Twentieth Century.

The backlash against the PRI may have had something to do with the rise of the center-left Partido de la Revolucion Democratica (PRD) in Mexico City. The PRD has governed the capital since the mayoral post became an elected, rather than appointed, position in 1997. During that period, the PRD has also held a majority in the Mexico City legislature (Asamblea Legislativa del Distrito Federal, ALDF).

The lack of action on the part of the PRI administration gave rise to citizen groups like the Coordinadora Unica de Damnificados, the Movimiento Urbano Popular, and the Frente Contra la Represion. Their leaders, including Marco Rascon, Javier Hidalgo, and Rene Bejarano, went on to become prominent PRD politicians in the Mexican capital. Other prominent leaders like Cuauhtemoc Cardenas and Porfirio Munoz Ledo formed the organization that became the backbone for the national PRD.

Cardenas later went on to represent a coalition of leftist organizations in the 1988 presidential election and by all accounts may have defeated Carlos Salinas de Gortari. Cardenas was leading his PRI rival before a mysterious computer malfunction halted the vote count. As soon as the computer "problems" were fixed, Salinas was reported to have raced ahead of Cardenas.

More than affecting political affiliation, however, the failure of authorities to react quickly to the earthquake seemed to empower ordinary citizens to demand that authorities respect their rights. "[The 1985 earthquake] had a lot to do with the awakening of people's consciences," said Jose Luis Lezama, an expert in urban studies at the Colegio de Mexico. "It had a lot to do with the rebirth of the democracy in which we are living in Mexico." Author Elena Poniatowska, who has just completed a book on first-hand accounts by victims of the 1985 earthquake, also said she noticed a major transformation among residents of the capital. "[The tragedy] has been transformed into the certainty that Mexicans have the ability to solve their own problems," she said in an interview with the Mexico City daily newspaper La Jornada.

The backlash against the PRI fostered some changes in the party, which partially abandoned its structure as an exclusively top-down organization to one that allowed more flexibility in its policies. "Within the government, there were changes as well," said Manuel Perlo Cohen, director of UNAM's program for Mexico City Studies. "A tendency to negotiate arose. [PRI officials] realized that if they didn't find a way to work in a less authoritarian manner, they would pave the way for more serious conflict."

And, in contrast to de la Madrid's failure to act, two prominent PRI members, Manuel Camacho Solis and Carlos Salinas de Gortari, made a special effort to reach out to the public in the aftermath
of the earthquake. Camacho eventually left the PRI to join the PRD and is now a top advisor to Andres Manuel Lopez Obrador, the PRD candidate in the 2006 presidential election. (Sources: Servicio Seismologico Nacional, www.ssn.unam.mx; The Chicago Tribune, 09/15/05; Associated Press, 09/18/05; Spanish news service EFE, 06/21/05, 09/19/05; Notimex, 09/18/05, 09/19/05; Los Angeles Times, 09/19/05; El Universal, 03/09/05, 06/22/05, 09/04/05, 09/19/05, 09/20/05; La Cronica de Hoy, 06/23/05, 09/19/05, 09/20/05; The Herald-Mexico City, 06/26/05, 09/19/05, 09/20/05; La Crisis, 09/12/05, 09/13/05, 09/19/05, 09/20/05; La Jornada, The Dallas Morning News, 09/19/05, 09/20/05)

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