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REPORT ON THE SOCIO-ECONOMIC IMPACT OF THE ERZINCAN, TURKEY EARTHQUAKE OF MARCH 13, 1992

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[k]The views expressed in this report are those of the author and not necessarily those of the Natural Hazards Center, the University of Colorado, or Baylor University.

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INTRODUCTION

In 1939, an earthquake of magnitude 8.0 occurred near the center of Erzincan, Turkey, along the North Anatolian fault. About 32,000 people died. The city was relocated a short distance and rebuilt. On Friday, March 13, 1992 at 7:19 p.m. another earthquake of magnitude 6.8 occurred with its epicenter less than 5 miles from "new" Erzincan's central business district. Within seconds, 541 people died, 3850 were injured, and thousands were made homeless. In the city and 137 surrounding villages, 7007 construction units were totally destroyed (irreparable), 9227 received medium damage (reparable) and 15,042 were lightly damaged. Erzincan's agriculture and livestock based economy was devastated by the deaths of 11,000 cattle, sheep, and goats. Approximately 2500 sheds and barns were destroyed, adding to the loss of the villagers' livelihood.

I conducted field research on two separate occasions following this disaster. Between March 17-26, 1992, I was the social scientist on the Earthquake Engineering Research Institute's Reconnaissance Team. The Natural Hazards Research and Applications Information Center (NHRAIC) sponsored my return trip from July 19 - August 18, 1992.

OBJECTIVE

My overall objective was to document and assess the earthquake's impact on the social and economic fabric of the Erzincan region. More specifically, my goal was to examine the emergency

relief efforts at the local, national, and international levels, the media response, and the role of the military.

ITINERARY AND INTERVIEWS

My NHRAIC field investigation covered 21 days (July 19-August 18) with interviews in Istanbul, Ankara, Erzurum and Erzincan. Data from my earlier participant observations immediately after the disaster were combined with structured and unstructured interviews (see attachment 2).

Consistent with the Gediz, Lice, and Erzurum earthquakes (Mitchell, 1976; 1977; 1978; 1981; and 1985) and in addition to the 18 interviews above, I conducted open-ended interviews with survivors from surrounding villages and from the main disaster site of Erzincan. Sample size was 64.

AN ACTIVE SEISMIC ZONE

Two days after the Friday, March 13, 1992 Richter magnitude 6.8 occurred in Erzincan, a Richter magnitude 6.1 aftershock struck near Pulumur, Tunceli province, less than 50 kilometers from Erzincan city. Earthquakes such as these occur frequently in Turkey. For example, disasters for the past 25 years include: Varto-Hinis, 1966, 2394 deaths; Adapazari, 1967, 89 deaths; Gediz, 1970, 1086 deaths; Bingol, 1971, 870 deaths; Lice, 1975, 2385 deaths; Muradiye, 1976, 3840 deaths; and Erzurum-Kars, 1983, 1155 deaths (Mitchell, 1985). Both Erzincan and Pulumur have experienced destructive earthquakes in the past. As indicated earlier, Erzincan was totally destroyed in 1939 with over 30,000 fatalities. More recently, Pulumur had 97 fatalities and

1282 houses destroyed in 1967. Turks are very aware that earthquakes occur in their nation, and many Turks equate their word deprem (earthquake) for Erzincan.

Following the Friday 6.8 main shock, thirteen aftershocks with one at 5.1 magnitude hit the area before midnight. There were 4 the next day, one with a magnitude of 5.0. Eight were registered on Sunday the 15th, with a 6.1 aftershock (Pulmumur) that caused more damage and contributed to more panic for the survivors. Aftershocks continued for days, and on Sunday, March 22, an aftershock registered 5.0. A total of 30 aftershocks above 4.0 followed the main shock through March 22. Four ranged from 5.0 to 6.1 (Ministry of Public Works and Settlement).

SITE AND SITUATION

Erzincan is a provincial capital located at 39.7 N and 39.5 E, 690 km. east of Turkey's capital, Ankara. City population was 92,000 according to the last census. The province covers 11,903 square km., contains 300,000 people, and is situated at 1200m above sea level, on an alluvial plain of the Euphrates basin. The plain is about 30 km. by 13 km., surrounded on the north and south by mountains rising to a height between 3000-3500m.

There are 569 villages and 10 townships in the province, including the central city of Erzincan. Seventy-five percent of the villages have a population of 250 or less.

Erzincan is a regional agricultural center containing small landholdings and experiencing migration from the region to larger cities in the western part of Turkey.

Villagers grow wheat, barley, beets, onions, potatoes, apples, pears, peaches, apricots, plums, cherries, grapes, walnuts, mulberries, and quince. The villagers also breed cattle, oxen, and sheep. Industry in the Province includes a sugar factory, a linen factory, a military heavy industry factory, dairies, tile and brick factories, and a shoe factory.

Unlike the 1983 Erzurum earthquake, which occurred with its epicenter about 210 kilometers from the present disaster and impacted mostly villages, the Erzincan earthquake had its epicenter less than 8 kilometers from its central business district. Because of the time of day, the winter season, and the religious practice of Ramazan, most of the population were inside their homes, in restaurants, or in mosques. Consequently a high percentage of fatalities were found in the Demirkent mosque (the minaret collapsed and fell through the roof, killing 27), the Roma and Urartu hotels, the Erzincan city club, and the nurses' dormitory wing of the State Hospital. Following another day of fasting during the month of Ramazan, most people were still eating the evening meal (Iftar) or were praying in the mosques. This was also true for the villagers. Given the very cold, damp winter weather, children were mostly inside.

Within the Erzincan city center, the Roma Hotel, the Urartu Hotel, the State Library, the Tourism Building, the Culture Center, and city orphanage were destroyed or heavily damaged. Of the 8778 building units in the city center, 22 percent (1997) collapsed or were heavily damaged, 31 percent (2800) received medium damage, and 45 percent (3981) were minimally damaged. Damage was classi-

fied by "units", which refers to an apartment, a single family house, or a business or office. After one week, estimates for total damage were about 4500 units destroyed, 6000 with medium damage, and 7000 with light damage. These figures increased significantly over the next month and by August reached those given in my introduction. One hundred thirty seven villages were damaged with 60 heavily damaged (more than 10 buildings destroyed).

CASUALTIES AND INJURIES

Casualties were at least 541 deaths, 3850 injuries, and 850 requiring hospital care. Most of the fatalities were crushed by collapsed concrete structures. The injured suffered fractures, spinal compressions, and lacerations. Over 200 multi-story structures, including five-seven story buildings, particularly those constructed by government financing, collapsed or were heavily damaged. These buildings contributed to a high percentage of casualties.

Medical care was severely impacted. The State Hospital (Devlet hastanesi); the Social Insurance Hospital (Soysal Sigorta hastanesi); and the Military Hospital (Asker hastanesi) collapsed or were heavily damaged. Consequently, patients were evacuated outside to a temporary medical tent facility. A mobile hospital was set up in the soccer stadium. Survivors were sent by ambulance, taxis, or private cars to Erzurum (189 km.), Elazig (269 km.), Tunceli (130 km.), Gumushane (150 km.) and Ankara (690 km.). At least one nursing student was taken to Istanbul (1103 km.).

During the first week, data indicated 60 percent of the injured

were taken to the Ataturk Erzurum hospital. A total of 300 earthquake patients were hospitalized in Erzurum, with 48 patients awaiting orthopedic corrective or amputation surgery on March 19. In August, data indicated only 106 survivors were hospitalized in Erzurum, although 270 were treated. Fatalities occurred up to 50 kms. from Erzincan. It appears 85 percent of the casualties occurred within a radius of 25 kilometers from the Erzincan epicenter.

SEARCH AND RESCUE

Search and rescue began almost immediately by surviving family members. Most were local volunteers with no equipment or training. It was understandably unorganized, random, and frantic. With the city's electric power shut down, searching was by auto headlights and flashlights during the first night.

The Governor of Erzurum ordered his deputy, Mr. Hayrettin Balcioglu, to lead an assistance team to Erzincan. At 2:00 a.m., Saturday, less than 7 hours after the event, Deputy Governor Balcioglu arrived in Erzincan with 13 ambulances, 70 doctors, 100 nurses, and medical and food supplies. The city's emergency response plan had not been put into action. There was no organized and controlled search and rescue at that time.

Major General Farmen, Chief of Joint United States Military Mission for Aid to Turkey, Ankara, visited Erzincan on Saturday, March 14. His purpose was to assess relief needs and establish a single U.S. military point of contact for support between Erzincan's Governor Mr. Yazicioglu and the Turkish Third Army, commanded by General Bayar. During a meeting between General Bayar

and Governor Yazicioglu, with General Farmen present, it was agreed that the Governor would take full control of the relief effort, with the full support of the military.

One day after the earthquake, President Ozal, Prime Minister Demirel, and other officials visited the city. Evidence indicates there were no concerted efforts at rescue by early afternoon. Prioritization of rescue attempts, crowd control, and assignment of equipment were not in effect.

Ambulances from Sivas, Erzincan, Erzurum and Elazig transported victims. Burials were underway on Saturday. Many families reportedly buried their kin without formal notification. Consequently, anonymous officials believe and it is possible that fatalities were higher than official figures (some estimate up to 1800).

Heavy debris removal was lacking immediately after the earthquake. On Saturday, there was a clear need for metal cutting torches, sledge hammers, saws, and heavy lifting equipment. These needs were increasingly met on Saturday, Sunday, and Monday. By Wednesday, heavy equipment from several provinces was employed. On Sunday, March 15, dump trucks were rapidly hauling debris out of the city.

Search and rescue were rapidly building on Sunday with the arrival of British, Swiss, German, and Greek specialists teams, with dogs and sound detector equipment. First prioritization of rescue was based on number of people in collapsed buildings. One week after the earthquake fatalities were still being removed from several buildings.

Foreign rescue teams began leaving on Tuesday, with most out by Wednesday, March 17.

EMERGENCY RESPONSE

During the initial hours, it appears grief, shock and timing effectively and temporarily neutralized the emergency response. It was very cold (below freezing) and night when the earthquake occurred. The electric power and water flow were interrupted. Many relatives and friends of the leadership hierarchy (Governor, Deputy Governor, Chief of Police, Mayor, etc.) were missing, killed, or injured. Almost everyone evacuated their buildings and roamed the streets. Thousands were searching for their relatives. Hundreds fled from the city, while as news filtered out of the city, thousands poured in to help.

Turkey has regional depots stockpiled for disaster response. These centers were alerted and began dispatching tents, blankets, food, etc. on Saturday, the first day after the earthquake.

National and International assistance also began on Saturday. By Friday, March 20, the government had supplied 17,524 tents, 42,000 blankets, 6 field kitchens, 6 generators, a water purification system, blood, and 6000 body bags. Bread was shipped in from Ankara, then by Erzurum and other provinces until Erzincan bakeries began baking on Saturday, March 21. Coal was given to the victims and they were declared tax exempt for 1991. Relief supplies that had arrived at Erzurum by March 20 included international donations of 2203 tents, 6494 blankets, 986 stretchers, 857 stoves, 308 first aid kits, and blood. Other aid arrived in Erzincan and/or Ankara from Greece, Russia, Saudi Arabia, Kuwait,

Belgium, and Pakistan. Americares chartered two Arrow Air DC-8s and sent over one million dollars of supplies into Erzurum.

Kizilay, Turkey's Red Cross, received and distributed international donations. By August, international (foreign) aid exceeded 8,748,000 dollars.

PUBLIC SERVICES

Medical facilities were destroyed or severely damaged in Erzincan. One doctor displayed his hands with blisters and calluses caused by four straight days of operating on earthquake victims. Doctors and nurses were available and adequate for recovery. Most complaints by medical specialists were about the lack of adequate equipment and facilities. Even under normal circumstances, medical equipment is not excessive in Eastern Turkey.

A strategic Army post is located in Erzincan. Its population of 30,000 experienced dozens of fatalities and injuries. At least 20 military were confirmed dead on Saturday, March 14. Immediately after assessing military damage, the Army commander sent troops into the city for search and rescue. Hence, law enforcement and search and rescue was augmented by about 2700 soldiers. Traffic control was operating on the three main routes into the city. Emergency law was decreed on Saturday, March 14.

MEDIA RESPONSE

Press response was very similar to past earthquakes (Mitchell, 1985). Coverage dwindled rapidly after the first week. Overall, coverage was comprehensive and reasonably accurate. All Turkish

dailies (Cumhuriyet, Gunaydin, Gunes, Hurriyet, Milliyet, Sabah, Tercuman, Turkiye, and Turkish Daily News) covered the story on Saturday, March 14th. Radio and television (Turkiye Radyo ve Telvizyon-TRT) sent newsmen to the scene and interviewers climbed through the rubble, conversed with the trapped victims, and sent the conversation back to the nation, live by satellite.

Typical headlines were: "Quake Flattens Erzincan"; "Quake Survivor Angry"; "Quake Toll Mounts"; "Hope Fades in Erzincan"; "Quake Victims Refused to Return to Their Homes"; "Aid the Quake Victims"; "Chaos in Erzincan"; "Exodus from Erzincan"; "Black Market Reports"; "Who Built these Buildings"; "Earthquake not Act of God, But Murder"; "Quake Revives Nightmare for City"; "Nation Competıng to Help Victims"; "Erzincan Official Criticized"; "Miraculous Rescue of Nurse"; "Cleaning Continues"; "Thousands Found Dead"; and "Erzincan Cut Off From World". The disaster was backpage and limited news for most newspapers by Wednesday, March 25th. A few articles updating reconstruction appeared occasionally through August 1993.

The newspaper Milliyet made an early appeal for national donations and printed donor contributions daily.

The TRT cancelled entertainment on Friday night immediately after receiving word of the disaster. Turkish Daily News cancelled its 30th Anniversary Celebration dinner party because of the tragedy.

Newspapers soon criticized the Governor of Erzincan for "incompetence and inexperience," then carried stories about the Governor voicing his concern that "people are evacuating Erzincan

by the thousands." A major story reported controversy about the equitable distribution of tents between the Sunni majority and the Alevite minority.

As in disasters worldwide, here too politics became an issue in the press. Turkish Daily News reported on March 17 that Democratic Leftist Party leader Ecevit was briefed on Governor Yazcioglu's "inefficiency". A story about public protest against the Governor was carried by the Turkish Daily News on March 19th.

Black marketing and personal hoarding of tents received wide coverage. Prices reportedly ranged from 400,000 TL ($65) to 2 million TL ($328). There were many rumors of outsiders illegally taking donated goods.

Another major story was violation of construction codes. The code permitted a maximum of three stories, but in recent years many government buildings had been built to 4-5 and some to 7 stories. Many new apartment buildings were also five or more stories. Most of these "high-rises" collapsed, or were heavily damaged.

Distribution of relief was also criticized in the press. This is normal following every disaster in Turkey, and often worldwide. Villagers felt neglected (e.g., Gumustarla, Yogurtlu, Ulalar and Kavaklitarla). Considering the timing and the magnitude of damage, the response was fairly understandable.

DISPLACED PERSONS

Practically all of the 91,000 residents of Erzincan city, and most of the villagers in 137 villages were unable or unwilling to return to their homes days after the earthquake. Unofficial estimates were 50-60,000 homeless on Monday, March 16. In August,

many still refused to return to their homes, even if minimally damaged.

Tents were distributed starting the day after the disaster and were still being distributed one week later. The Minister of State announced on Monday, March 23, that "2000 families will be in prefab homes within a month and that construction will begin this week."

Many villagers used plastic sheets and tarps to construct temporary shelters. These shelters were still in use six months after the disaster.

Bread was distributed free for the first six days. There was at least three field kitchens in the city, including those run by Kizilay and the Army. Some vegetable stands were operating within days, several by Friday, March 20. A few stores and prepared food outlets were partially operating on Friday, March 20.

Political party leader Inonu was briefed by city officials on Sunday, March 15, that Erzincan would have the "bulk of the wreckage cleaned in a week, and relief would be completed in 20 days."

Hundreds reportedly left the city for other cities and towns. Many interviewees expressed intentions to leave soon as they could sell their property and put their lives back in order.

RECONSTRUCTION

In August 1992 the government's goal of massive rebuilding by December was well underway. As much as $700 million is being spent on rebuilding Erzincan and its villages. Over $200 million is from a World Bank loan. These funds have been invested in 4000

single-family homes and 2500 condominium apartment units.

The government has involved the Middle East Technical University, the Bosphorous University, and the Istanbul Technical University in the planning criteria, and design of both new and retrofit and repair construction. This is a massive undertaking, and a goal of December 1992 was set to restore normalcy to the region. This was a commendable but extraordinary challenge. Given that at least 40% of the population was displaced, and everyone deprived of essential services (hospitals were destroyed or severly damaged), this goal was realistic and perhaps achievable.

Today, with more motivation and direction than in the past, Turkish academicians, engineers and government officials are collaborating to ensure that new construction conforms to earthquake zoning codes. Laws existed in the past but enforcement is a challenge. It also holds true for the future.

Late in 1983 the Erzurum earthquake severely damaged many large public buildings in Erzincan. Government damage assessment reports called for reinforcement of the Urartu hotel, the Vakif business center, the Etibank building, a sugar factory, the nurses' dormitory, a maternity hospital, the city bus terminal, all three hospitals, and a textile spinning plant. Evidently only cosmetic and superficial repairs were made. All of these buildings collapsed with heavy loss of life on March 13. Probably, and responding residents believe, many lives were needlessly lost. Hence, there is a general feeling of distrust by many people in Erzincan.

Official estimates of direct loss caused by the earthquake

is now about 445 million dollars (3.3 trillion Turkish lira). Indirect losses are another 222.5 million dollars. Construction and restoration were moving at a quick pace in August. Five hundred small temporary structures for businesses were being built by Ankara to assist in restoring the economy. About four thousand new housing units were under construction along with private rebuilding. The goal is to complete the new homes before December. Winters are severe in this region and concrete cannot be poured after late October.

There was little commerce in Erzincan in August but this should slightly improve with the new businesses. Yet the economy is greatly handicapped by the outmigration of about 15% of the population since the earthquake. Teachers (1100 out of 1200), police, and civil servants have asked for transfers out of the city. Many civil servants have sent their families to Ankara or other cities. These government employees are now on a "tolerated" 3 day work schedule, traveling on Friday and Monday to and from Ankara for family visits. Probably, there will be no school in Erzincan this year, since understandably school construction has priority after family units. People still sleep outdoors even if their houses have been declared structurally sound by officials. Many have little confidence in official bureaucracy because of the collapsed buildings which have been condemned then apparently cleared for use after the 1983 earthquake.

FINDINGS AND RECOMMENDATIONS

* It is understandable that a Provincial Rescue and Aid Committee cannot carry out its search or rescue and relief responsibilities

when it becomes a direct victim of the disaster. (Team members were in grief, demoralized, and psychologically unable to respond beyond the survival needs of their individual families.)

* Provincial leaders cannot carry out their responsibilities (Governor, Mayor, Police Chief, etc.) when they themselves are victims.
* Quality control and construction practices for building in seismic zones were not in compliance with the 1975 Turkish Building Code.
* Search and rescue teams need training and equipment. Civil Defense rescue unit should be increased.
* Red Cross (Kizilay) response to earthquake disasters was improved greatly since the Gediz (1970) earthquake.
* Similar to the Gediz (1970), Lice (1976), and Erzurum (1983) earthquake, a massive reconstruction program is under way. A study to assess implementation of lessons learned from previous disasters should be conducted.
* An assessment of Izmir's Provincial Rescue and Aid Committee should be accomplished soon. Increased seismicity in the Izmir region indicates serious need for preparedness.

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INTERVIEWEES
(Attachment 2)

Mr. Fikret Cuhadaroglu
Deputy Governor of Erzincan

Mr. Talip Kaban
Mayor of Erzincan

Dr. Selami Gozenc
Geographical Institute
University of Istanbul

Dr. Erol Tumertekin and
Dr. Nazmiye Ozguc
Geographical Institute
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Mr. Mehmet Urun
Mayor of Gumustarla

Mr. Hayrettin Balcioglu
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Prof. Polat Gulkan
Department of Civil Engineering
Middle East Technical University

Prof. Mehmet Tomanay
Department of Economics
Gazi University

Mr. Arslan Basarir
Director of Foreign Relations
Turkish Red Crescent