

Earthquake Vulnerability



Feryal Alayont

Joint work with M. Serdar Alayont, B.S. in architecture, former Head of the local Chamber of Architects, Denizli, Turkey
H. Serhat Alayont, M.S. in civil engineering

Human toll of the disaster

- Over 42,310 dead in Turkey (official estimate as of today); unofficial estimates 150K-200K
- Thousands more injured
- Millions of people homeless; >150K of collapsed/severely damaged buildings
- Infrastructure destroyed and even people with homes do not have basic needs: water, electricity, heating



Source: Ministry of Environment, Urbanisation and Climate Change news, Feb 29, 2023; <https://www.npr.org/2023/02/11/1155955553/turkey-earthquake-gaziantep-displaced-people>

Earthquake Vulnerability in Southeast Turkey

Three main factors contributed to the significant loss of human lives and property destruction:

- Unsafe building practices
- Ineffective disaster and risk management
- Vulnerability of the affected population and the geographical region

Unsafe Building Practices



Credit: New York Times, Feb 9, 2023 & TMMOB IMO report, Feb 14, 2023

Unsafe Building Practices

- Unsafe older building construction based on earlier codes (pre-1998): Code strengthened to avoid collapses
- Untrustworthy construction industry: lower quality and/or lesser quantity of materials
- Unskilled labor used in projects: building construction and design
- Allowing construction of high rise buildings on weak ground: potential soil liquefaction and amplification
- Rapid and unsafe urban planning
- Insufficient/unethical building inspection practices
- Lax regulation and enforcement, including amnesties for buildings built without permits

Source: TMMOB IMO report, Feb 14, 2023; ITU report, Feb 2023.

Ineffective Disaster and Risk Management

“If we had equipment and if we [had] reached Samandag quicker, we could have easily saved more. There were so many voices that we couldn’t count. But after hours and hours the voices were going mute.”

Source: How Erdoğan’s Obsession With Power Got in the Way of Turkey’s Earthquake Response by Alec Luhn, Time, Feb 18, 2023

Ineffective Disaster and Risk Management

- AFAD (Turkey's disaster management agency) was slow and did not have enough resources to (resource mismanagement)
- Army was deployed late and was less effective than before
- Bad coordination of AFAD with other non-profits and partners
- More established older non-profits were ineffective
- Ineffective communication practices: Insufficient cell phone towers; relying on social media; blocking of Twitter by the government for an essential 12-hour period

The more I study it the more I realize that the politics of the situation and the lack of resources and management is making it almost unbearable to even watch it unfold on television.

– Dr. Patricia Bodelson, in an online seminar on Feb 9

Sources: TMMOB preliminary report 2023; ITU preliminary report Feb 2023

Vulnerability of the affected population and the geographical region



Credit : Earthquake in Turkey is only the latest tragedy for refugees, AP News, Feb 12, 2023

Vulnerability of the affected population and the geographical region

- Region is the lowest GDP among seven regions
- Many Syrian refugees live in the area
- Other minoritized populations: Alevis, Arabs, Christians, Kurds
- Poor people live in older apartments; have fewer resources
- The area not easily accessible; roads are not as well kept
- High population density in affected cities
- Informational vulnerability
- Weather conditions; time of the day

Source: Martin Degg & Jacqueline Homan (2005) Earthquake Vulnerability in the Middle East, *Geography*, 90:1, 54-66

The extent of human vulnerability to earthquakes in the Middle East is now such that it can only effectively be addressed by engendering collective cultures ('seismic cultures') of prevention.

-Martin Degg and Jacqueline Homan

Source: Martin Degg & Jacqueline Homan (2005) Earthquake Vulnerability in the Middle East, *Geography*, 90:1, 54-66

Humanizing the data

The stories...



Photo credit: Adem Altan/AFP/Getty Images

What did WE do wrong?

**If you are not aware of how you are part of the problem,
you can't be part of the solution.**

-David Stroh

Source: Stroh, David Peter. *Systems thinking for social change: A practical guide to solving complex problems, avoiding unintended consequences, and achieving lasting results*. Chelsea Green Publishing, 2015.

References

- Donner, W. and Rodríguez, H. (2011) Disaster Risk and Vulnerability: The Role and Impact of Population and Society. Retrieved from <https://www.prb.org/resources/disaster-risk/>, access Feb 18, 2023
- Guzel, M, Abuelgasim, F. and Titova, T. Earthquake in Turkey is only the latest tragedy for refugees, AP News, Feb 12, 2023. Retrieved from <https://apnews.com/article/syria-turkey-earthquakes-fdda60024380bf8d576b169408bdce7e>, access Feb 18, 2023
- Death Toll in Turkey and Syria From Earthquake Passes 20,000, Feb 9, 2023. Retrieved from <https://www.nytimes.com/live/2023/02/09/world/turkey-syria-earthquake>, access Feb 18, 2023
- 1997 Turkish Earthquake Building Code with 1998 Amendments (in Turkish) (1998). Retrieved from https://webdosya.csb.gov.tr/db/destek/icerikler/1_2_1997_deprem_yonetmel-g--20191127140319.pdf, access date Feb 19, 2023
- Preliminary Analysis on February 6 2023 Kahramanmaras, Elbistan and Pazarcik Earthquakes (in Turkish) by the Chamber of Civil Engineers (TMMOB IMO), Turkey (2023). Retrieved from <https://www.imo.org.tr/Eklenti/8175.imo-deprem-raporu-2pdf.pdf?0>, access date Feb 19, 2023
- Preliminary Analysis of February 6 Kahramanmaras, Hatay & Kahramanmaras Earthquakes (in Turkish) by Istanbul Technical University (2023). Retrieved from https://haberler.itu.edu.tr/docs/default-source/default-document-library/2023_itu_deprem_on_raporu.pdf, access Feb 19, 2023
- Damage analysis completed in 830,738 buildings in the earthquake region (in Turkish) (Feb 19 2023). Retrieved from <https://www.csb.gov.tr/deprem-bolgelerinde-830-bin-783-binadaki-3-milyon-273-bin-605-bagimsiz-birimde-hasar-tespit-calismasi-yapildi-bakanlik-faaliyetleri-38439>, access Feb 20, 2023
- TMMOB Preliminary Report on the Earthquake (in Turkish) (Feb 9, 2023). Retrieved from <https://www.tmmob.org.tr/icerik/tmmob-degerlendirme-raporu-yayimlandi>, access Feb 20, 2023
- Martin Degg & Jacqueline Homan (2005) Earthquake Vulnerability in the Middle East, Geography, 90:1, 54-66, DOI: 10.1080/00167487.2005.12094117, access Feb 20, 2023
- Stroh, David Peter. *Systems thinking for social change: A practical guide to solving complex problems, avoiding unintended consequences, and achieving lasting results*. Chelsea Green Publishing, 2015.

