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Map of Earthquake Hazard and Ongoing Residential Construction Projects in Istanbul

Introduction

Turkey is an earthquake country, that faces the challenges of existing over multiple active fault lines, and always living temporally between earthquakes. These challenges and risks are only exacerbated in Turkey's largest metropolitan area, Istanbul. Istanbul has recently suffered a major earthquake in 1999, amounting to major losses in life and capital. Despite this, the nationwide urbanization policies carried out by the current Justice and Development Party (*Adalet ve Kalkinma Partisi, AKP*) have only recently begun prioritizing concerns for earthquake safety. Within this context, I wanted to map out where the state-led "urban transformation" and private construction projects with regards to estimations of earthquake hazard in Istanbul, and found that there has been no significant effort to avoid earthquake-prone zones for construction. I have also found evidence, albeit non-conclusive, that suggests that these new construction projects have not strictly followed earthquake safety regulations, creating a precarious situation for citizens who have already been dispossessed or relocated by these policies.

Istanbul and Earthquakes — A Recent History

Istanbul is situated close to the Northern Anatolian Fault line, which passes through the Marmara Sea, about 20 kilometers (12.42 miles) south of Istanbul's southern coastline. The city

has experienced two major earthquakes, with a magnitude above 7 in the Richter scale, in the last two hundred years: one in 1894, and one in 1999.

According to a 2000 assessment by Ozerdem and Barakat, the 1999 Marmara Earthquake caused 17,127 deaths, 43,953 hospitalizations, and monetary loss estimated to be between US\$9—13 billion, with nearly the same amount of economic loss as economic activity in the area was halted.¹

It is important to note that the epicenter of the earthquake was not directly on Istanbul, but rather on the neighboring province of Izmit. In 2000, Parsons et al. suggested that the tectonic shifts caused increase higher chances of an earthquake occurring closer to Istanbul, and estimated that there is a $32\pm 12\%$ probability of a strong earthquake occurring in the area within the next decade, and a $62\pm 15\%$ probability of a strong earthquake occurring in the next 30 years.²

Urbanization of Istanbul within the context of earthquakes

Although there were earthquake safety regulations in place in the form of the 1997 Earthquake Resistant Design Code for Buildings, both Istanbul and the surrounding provinces suffered great damage to its buildings in the Marmara Earthquake. Ozerdem and Barakat propose two reasons why the legislation was ineffective: first, that many buildings, including recently constructed residential projects, did not strictly adhere to the code, and second, that the legislation lacked auxiliary efforts such as public awareness campaigns and building insurance schemes.³

¹ Alparslan Ozerdem and Sultan Barakat, “After the Marmara Earthquake: Lessons for Avoiding Short Cuts to Disasters,” *Third World Quarterly* 21 No.3 (2000), 425

² Tom Parsons et al. “Heightened Odds of Large Earthquakes Near Istanbul: An Interaction-Based Probability Calculation,” *Science* 288 (2000), 661

³ Ozerdem and Barakat, “After the Marmara Earthquake”, 430

There were efforts for recovery and future mitigation against earthquakes after the 1999 earthquake— with the most notable being the Istanbul Seismic Risk Mitigation Project, run jointly by the Turkish government and the World Bank between 2004 and 2015, with a fund of US\$550 million.⁴

However, these mitigative construction efforts are overshadowed by the AKP government's wider scale urbanization policies, both in terms of budget and in terms of mediatization. Reviewing these policies only within the context of residential construction, we can find two distinct categories: private residential projects, focused towards creating middle-to-upper class suburban gated communities, and public urban transformation projects, which include a series of state-led, yet privately executed renovations of historically working-class neighborhoods.

Both of these policies, but especially urban transformation, have been studied extensively under the lens of gentrification, urbanism and labor. Islam and Sakizlioglu observed the process of urban transformation in two neighborhoods, Sulukule and Tarlabasi. They found that the process involves the aggregation of property rights under local administrators⁵ and the sudden displacement of residents, hindering economic prosperity and sense of community in the neighborhoods.⁶

However, the review and critique of these construction projects under the lens of earthquake safety has been missing from both policy and academic circles until recently. In light of two earthquakes with respective magnitudes of 5.4 and 5.6 that occurred in September 2019, the newly elected mayor of Istanbul, Ekrem Imamoglu declared a mass mobilization

⁴ "The Istanbul Seismic Risk Mitigation Project," World Bank, accessed October 16, 2019, <https://www.worldbank.org/en/country/turkey/brief/the-istanbul-seismic-risk-mitigation-project>

⁵ Tolga Islam and Bahar Sakizlioglu, "The making of, and resistance to, state-led gentrification in Istanbul, Turkey", *Global Gentrifications: Uneven development and displacement*. Bristol University Press, Policy Press (2015), 250

⁶ Islam and Sakizlioglu, "The making of, and resistance to, state-led gentrification in Istanbul, Turkey", 251.

campaign for earthquake safety. He proclaimed that urbanization in Istanbul within the twenty years since the Marmara Earthquake have not been successful in integrating the widespread earthquake mitigation efforts, projecting that an earthquake of a similar magnitude to the Marmara Earthquake could cause 22.6% of buildings in Istanbul to collapse, causing 25 million metric tons of debris which would cause massive infrastructural damage, resulting in over US\$20 billion in structural and non-structural damage.⁷

Mapping and Results

Within this context, I observe how twenty years of urban transformation and private residential construction have been performed with regards to earthquake safety. As a preliminary effort, I consulted two other mapping projects. First, I consulted “Istanbul’s Mega Projects”, is an index of major construction projects and urban transformation efforts in Istanbul.⁸ I collected data about the locations of these projects, as well as their public/private status, the companies undertaking them, and their budgets, but chose to omit the latter data as they were not consistently present across all projects. Next, I cross-referenced this locational data with a 2014 earthquake hazard map created by Karaman and Erdem,⁹ which estimates the degree of intensity with which each municipality in Istanbul would be affected by an earthquake.

⁷ “İBB Başkanı İmamoğlu: Deprem Seferberliğini Başlatıyoruz,” Cumhuriyet Türkiye Haberleri, October 14, 2019, http://www.cumhuriyet.com.tr/haber/turkiye/1628242/iBB_Baskani_imamoglu__Deprem_seferberligini_baslatiyoruz.html.

⁸ “Istanbul's Mega Projects,” Istanbul's Mega Projects, accessed October 16, 2019. <http://en.megaprojeleristanbul.com/>.

⁹ Himmet Karaman and Turan Erden, “Net Earthquake Hazard and Elements at Risk (NEaR) Map Creation for City of Istanbul via Spatial Multi-Criteria Decision Analysis,” *Natural Hazards* 73, No.2 (2014): 703

I found that out of 46 projects listed, 24 (~52%) of them are located in municipalities marked with a hazard scale of 3 out of 5, or above, and 9 (~19%) of them located in regions most at risk of earthquake damage.

Conclusion

Placing this information in parallel with Imamoglu's statements about Istanbul's continuing earthquake risk, it is dubious whether these projects were truly constructed in compliance with earthquake safety regulations, creating a precarious situation for lives, labor and economic stability. In addition, considering Istanbul's position as the population and economic center of Turkey, the risk of such damage to the city poses devastating implications for the nation's social, political and economic stability as well.

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