Türkiye's Earthquakes: A Humanitarian Catastrophe 2023.Türkiye'nin Depremleri: Bir İnsani Felaket 2023.

Risking Citizens' Lives for Profitability – February 6
Kârlılık için Vatandaşların Hayatlarını Riske Atmak – 6 Şubat
First Body of Published Research Conducted After this Tragedy.

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Abstract **– Türkiye's founder, Mustafa Kemal Atatürk once wrote, "Our true mentor in life is science." What would he have thought about February 6, 2023. What was not done prior and post-disastrous Earthquakes? This research paper stands for the people whose lives were lost unnecessarily in this human tragedy. The research will illustrate the following in absolute detail. The lethargic response by both the Turkish government and its military to aid the affected regions which left destitute survivors amidst the toxic dust and rubble with their family members entombed in their former homes in subzero conditions. Secondly, the results will also show that Türkiye has a long history of seismic activity and the region in question was due for a large earthquake. Thirdly, vast comparisons were made between Türkiye and Japan; this draft will highlight the lack of action following the 1999 Kocaeli-Izmit quakes compared to the modernity of Japan where buildings and lives are preserved by a big number. Fourthly, the paper will prove the nepotism and corruption that has engulfed Türkiye within the building industry and the lax in enforcing regulations, and its president's continued war on academe. Fifth, this research had also investigated the differences between Japan's and Türkiye's earthquake early warning systems and building designs. Sixth, the investigation has proved once and for all that earthquake prediction is a fallacy, where the foremost authority in seismology has elucidated coherently on this issue, rather than academics stating publicly that another big quake could occur in a certain timeframe. Sixth, Turkish politics is now in turmoil since this calamity, political party infighting trying to score points shamefully prior to a pending election, while victims still suffer. Finally, this was a difficult project for this researcher to undertake, where so many lives and buildings destroyed, could have been avoided.**

Keywords**:**
Earthquakes, Construction, Seismic, History, Japan, Magnitude, Regulations, Structure, Events, Response, Energy, Government, Warning, Event, and Faults.

Introduction

As the preface, this author would like to convey one's condolences to the Republic of Türkiye and to affected people in northern Syria. Tüm türk vatandaşlarının başı sağolsun and تعازي ، خسارتك على.

Secondly, I would like to commend Turkish TV100 - especially seasoned journalist Uğur Dündar and his colleagues for their vital reporting. Once this academic had the pleasure to meet Dr. Dündar when he received an honorary Doctorate in Northern Cyprus in 2004/5. And thanks to Habertürk for their explorative debates throughout this terrible event. Both asked hard relevant questions directly, therefore informed the public of what was really occurring on the ground which actuated a global humanitarian support apparatus from friends and foes likewise, (International relations achievement) when they were really needed, as the Turkish government were veritably lethargic within its original response. This critical unbiased journalism was conveyed internationally, thus, supported all the aid organisations leading those to affecting a plan with haste to both southern Türkiye and northern Syria. As a result, this exploration has been conducted scientifically with coherent delineation and had instanced this author's empirical exploration findings.

A Portuguese 1998 Nobel literature laureate once wrote: Man is a creature that is constantly "under construction", but also, in a parallel way, always in a state of perpetual destruction.

At 04:17 on the 6th of February 2023, a disastrous 7.7 magnitude earthquake hit the Turkish south-eastern city of Kahramanmaraş, this preceded further huge tremor from the neighbouring region to the south named Gaziantep, registering an analogous violent 7.6 magnitude Earthquake. Following one's reading of material pertaining the energy released, the finite results illustrated that it is not directly original to a weight or mass dimension like tons, still, to give you an idea of the quantum of energy released by a 7.7 magnitude earthquake, it would be original to the energy released by exploding, 230,000 tons of TNT(trinitrotoluene). [49]. You

will observe from the calculations presented in this paper that in fact, the energy released on this day was a combined strength of a magnitude 8.0, moreover, equivalent to a yield and moment magnitude models of 1,500 Hiroshima Bombs dropped in 1945.
Other areas affected were Hatay, Adıyaman, Malatya, Kilis, Osmaniye, including Diyarbakır, Şanlıurfa, and Adana. Forty-eight hours following the ruinous event, numerous citizens remained on their own, sifting through the debris of their structures with their own bloodied hands trying to free their entombed family members in sub-zero temperatures. In short, this researcher and numerous transnational organisations have now bear substantiation to the lack of speedy action incontinently following this terrible event. However, the Turkish fortified forces could have supplied their multitudinous helicopters to all affected areas with brigades of specialists and of course aid. It is now without doubt following further investigation that the Turkish government failed its accreditation with the people through the " Golden period " the first 72 hours post-event. The Jandarma (Military Police) and local police, were there on the ground, so where were their military compatriots for 4 days? To make matters worse for the ruling government and military commanders, a British fire service specialist team arrived in an affected area before the Turkish authorities had. Still, as this paper is related to the structural integrity debate and the mass mortality witnessed, however, Syria has not been included from the exploration data collection, owing to its structures had remained within its continued civil war independent locale, thus, their own respective integrities had been already substantially weakened from nonstop shelling. Moreover, for data analytical purposes, the statistics would not correlate sufficiently to relate to the Turkish data collection as comparable as an experimental group. Nonetheless, the main northern Syrian locales affected were Aleppo, Latakia, Hama, and with structures damaged and numerous reported to be ruined. [52].
According to the majority of citizens affected, was the response to the initial earthquakes, attributing too slow-lethargic relief to affected areas, and the laxed building regulations supposedly imposed by the current government, following its election victory in the aftermath of the devastating Kocaeli/Izmit quakes in 1999.
The results of this study will show the deliberate negligence and the flouting of regulations throughout the building industry, whereby, has continued unabated since the said Kocaeli quakes. In short, this calamitous event was the most destructive in this author's living memory, -more so, compared to the two 1999 seismic events which occurred in the same year. As these findings pertaining this research were being drafted, the total mortality rates were steadily approaching 45,000 souls lost, and ˜ 7,500 buildings destroyed or rendered useless, therefore uninhabitable. The psychosocial impact on survivors has been added as a contributing variable in light of this disastrous episode; to investigate what can be achieved with modern applications of therapy for children, adolescents, and parents.
This is the first scientific study that has been published since said atrocious event. This author will delineate all elements of this unnecessary loss of life, leaving no stone unturned in the literal and scientific sense. As Türkiye is a second home for this author, it is a duty to the citizens to decipher the untruth to the empirical. Thus, a comparison is made using logarithmic calculations of magnitude force of energy in line with current practices adopted in Japan. Equations follow USGS guidelines to ferment this arithmetic relationship with Geometric logarithmic calculations to discern the least differentiation of the mean between the 2011 Great Quake of Japan compared to February 6, 2023. Additionally, should notable Turkish academics be publicizing forecasts and projections to the public, where there is first no validated science for this, moreover, their actions could inflame a very concerned populous, adding more psychosomatic stress to the mental trauma experienced. This study will explain the science accurately, for both the layman, and academics alike.
According to the FBI, a serial killer is defined as the deliberate taking of more than a series of three or more lives or killings. [17 p.7]. To be included within all the forthcoming prosecutions thereof, developers, structural engineers, surveyors, and municipality bureaucrats, of whom applied their respective stamped signatures to the planning permission phases, prior to the volatile buildings' construction, - ought to be deemed as mass murderers for profit. What would be a just sentence by the Turkish judiciary for such heinous crimes?
Finally, one would like to convey appreciation to one of the world's renowned seismologist Dr. Lucy M. Jones for replying to certain questions that was asked of her. This study would not have been achieved without her specialist knowledge therefore, contribution to the controversy of earthquake prediction. [18]
With thanks from this author for the exposition of data in said research, thus, to aid all the affected citizens of Republic of Türkiye. It has been one's academic vocation over three decades to aid the memory of the lives that were unfortunately lost due continued administrational negligence of the highest order.

Abbreviations and Acronyms

USGS – United States Geological Survey.
TRT – The Turkish Radio and Television Corporation.
WDMMA–World Directory of Modern Military Aircraft
ADRC – Asia Disaster Reduction Center.

Method[1]

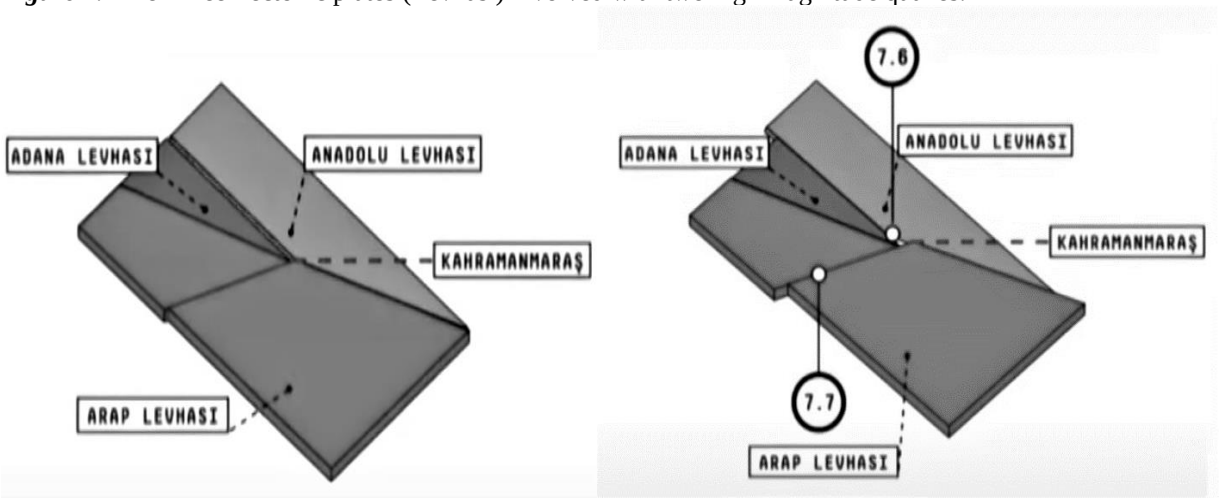
Firstly, this body of research itself was comprised of fluid elements from historic data to current data streams prior to and post-earthquakes. Finally, i) Mathematically – Statistically, Standard Deviation Deaths Caused & Margin of error between the Magnitude of Earthquakes of Türkiye and Japan Difference in Error was used as a viable instrument. ii) Geometric Mean Tool was used for a Larger Proportionate variable as Honshu 2011, which was a much larger quake within the data group compared to averages experiences in Türkiye. iii) USGS magnitude scales and logarithmic calculations have been assigned to discerning force and severity of single quakes and a combined quake scenario which is pertinent to this study of south-east Türkiye's tragedy.

Delimitations

The premise of this research was to expose the shoddy regulations enforcement and malpractices within the Turkish construction industry; Finally, detailed comparisons and statistical analysis has been reflected within all data presented following all variables within the datasets, conforming to standard objective analytical practice within empirical discovery.

What had caused these recent series of Earthquakes in both Gaziantep and Kahramanmaraş within Nine hours of each other?

Figure 1. The Three Tectonic plates (Levhasi) involved with two high magnitude quakes.



Source: Prof. Dr. Mehmet Celâl Şengör – Istanbul Teknik University. (2023) Haber Turk.

In short, there was a great slip between the plates resulting in a release of energy that had travelled 500 kilometres along the southern Anatolian fault. Noted Turkish Geologist Professor Mehmet Celâl Şengör's model *fig. 1*. Was simple to delineate for the general public and to visualize for this paper's purpose. [43].

At this moment in time, this study will take you through the findings step-by-step obviously commencing with the history of Turkish tectonic-seismic events leading to a more comprehensive overview of the resulting situation which occurred, via these extrapolated data findings, Commencing with Türkiye's long seismic history.

Türkiye's Seismic History[2]

Turkey is internationally recognized as a very volatile area of tectonic activity.

Table 1. Turkish Seismic Activity over the past 2000 years.

No.	Year	Rulers	Location	Magnitude (Mw)	˜ Deaths Recorded
1.	11 A.D.	Roman	Manisa	7.0	
2.	115	Roman	Antakya – *Antioch*	**7.5 ***	(˜ 260,000)
3.	141	Roman	Marmaris	7.0	
4.	141	Roman	Aegean Sea	7.0	
5.	526	Byzantine	Antakya	**7.5 ***	(˜ 250,000)
6.	557	Byzantine	Constantinople	6.4	
7.	1268	Anatolian	Adana	7.0	(16,000)
8.	1509	Ottoman	Istanbul	**7.2-8.0 ***	(13,000)
9.	1653	Ottoman	Izmir – Smyrna	6.8	(2,500)
10.	1668	Ottoman	Samsung	**8.0 ***	(8,000)
11.	1688	Ottoman	Izmir	7.0	(18,000)
12.	1766	Ottoman	Sea of Marmara	7.1 [Tsunami Istanbul]	(4,000)

13.	1855	Ottoman	Bursa	6.7	(1,900)
14.	1859	Ottoman	Erzurum	6.1	(15,000)
15.	1881	Ottoman	Izmir (Çeşme)	7.3	x̄ (100)
16.	1894	Ottoman	Izmit	7.0	(149,000)
17.	1919	Ottoman	Ayvalık	7.0	(3,000)
18.	1930	Republic	Hakkâri	7.2	x̄ (2,000)
19.	1939	Republic	Erzincan	**7.9 ***	(32,000)
20.	1942	Republic	Tokat	7.0	(3,000)
21.	1943	Republic	Kastamonu	7.2	(4,000)
22.	1944	Republic	Bolu	7.2	(3,959)
23.	1966	Republic	Muş	6.9	(2,600)
24.	1970	Republic	Kütahya	7.2	(1,086)
25.	1975	Republic	Diyarbakır	6.6	(˜ 285,000)
26.	1976	Republic	Van	**7.5 ***	(3,040)
27.	1983	Republic	Erzurum	6.9	(1,055)
28.	**1999**	**Republic**	**Gölcük 17/8/99**	**7.4 ***	**(18,373)**
29.	**1999**	**Republic**	**Düzce 2/11/99**	**7.2**	**(1,000)**
30.	**2011**	**Republic**	**Van**	**7.2**	**(604)**
31.	**2020**	**Republic**	**Elazığ**	**6.8**	**(41)**
32.	**2020**	**Republic**	**Izmir**	**6.9**	**(117)**
33.	2023	Republic	Kahramanmaraş Time 04:17	**7.7 ***	¬
34.	2023	Republic	Gaziantep Time +9 hours later (Same day)	**7.6 ***	Total 2 Quakes **(45,000)**
				x̄ - μ 7.1	

Key: * Denotes magnitudes higher than 7.4 on the Richter Scale.
Period of reflection since 1999 seismic events. (M_W) Moment Magnitude Scale.

In Table 1. Over a four-imperator epoch clearly illustrates that the entire Republic of Türkiye has been a major seismic zone. In fact, to delineate further, at least five regions have had more than one major (For inhabited structures) tectonic event [6.1-7.5] over two millennia: Antakya = 7.5,7.5 Istanbul = 6.4, (7.2-8.0) Izmir = 6.8-7.0 Erzurum = 6.1- 6.9 and Van 7.2 -7.5. The period of reflection data since the 1999 episodes in both Gölcük and Düzce the same year, was also recorded to show the time period from this tragic time, to prior to the south-eastern Türkiye quakes registered in both Kahramanmaraş at 04:17 am February 2023 and Gaziantep nine hours later, yet once more, the very same day. The period of reflection or aftermath is categorized for the said nation to evaluate why so many inhabitants perished in 1999. And which measures are needed and had been implemented to prevent such casualties in the future? Moreover, the vital question to be asked is had corrective measures been implemented over the 24 years; were lessons learned since both August 17, 1999, and November 12, 1999, resulting in 17,845 deaths and 300,000 more displaced and rendered homeless?
The data also shows that cities that had one major seismic event, would be In line with a further significant quake in the future.

Table 2. Earthquake Magnitude Scales. (Government of Canada) Revised 2021. [7]

Magnitude	Effects Experienced in each Seismic Event
≤ 3.5	This is rarely felt, but only while in a seated position. Hardly any damage was caused.
3.5 – 5.4	This is usually felt, and rarely causes any major damage.

< 6.0	Easily felt, well-built structures suffer slight damage, however, has a major impact on poorly designed and older buildings in smaller remote regions.
6.1 – 6.9	Can cause significant damage to poorly erected structures and slight damage to other well-made dwellings in areas up to approximately a 100-kilometer radius in populated domiciled regions. (Loss of life)
7.0 – 7.9	**A "Major" earthquake. Large areas can receive significant structural damage over larger land masses. (Loss of life expected) i.e., Kahramanmaraş and Gaziantep.**
8.0 - 8.9	A "Great" seismic event. Causes serious structural damage, and a significant loss of life over a wider area of several hundred kilometers long.
9.0	These are very rare episode quakes. Causes major destruction over 1000 km. Significant casualty figures can be expected. A disastrous event is realistically expected.
10.0	At this moment in time, there are no known faults in existence for this magnitude energy "catastrophic" earthquake.

Table 2. denotes both an Earthquake's magnitude scale inclusive of the effects experienced to the demography of given activity i.e., loss of life, structural damage, and fault disruption.

The conception of earthquake magnitude and the use of logarithmic equations to measure it were developed by a seismologist named Charles Richter, and his coworker Beno Gutenberg in the 1930s. Richter and Gutenberg created the Richter scale which assigns a numerical value to the quantum of seismic energy an earthquake emits. The Richter scale is based on logarithms, meaning that an earthquake with a magnitude of seven releases 10 times as important energy as an earthquake with a magnitude of 6, and 100 times as important energy as an earthquake with a magnitude of 5. The Richter scale has once more been replaced by the moment magnitude scale, but the conception of measuring earthquake magnitude using logarithmic equations remains a valuable tool in seismology.

The magnitude of an earthquake, such as a 7.7 magnitude earthquake, can be calculated using the Richter magnitude scale, its amplitude of the seismic waves the earthquake emits. A formula for earthquake magnitude is:

Richter = M = log10(A/T) + K Where the variables are:

M is the magnitude
A Maximum amplitude of waves in microns (1 micron = 0.000001 meter)
T Period of the seismic waves in seconds
K is a constant that varies depending on the seismograph used
For the first Gaziantep 7.7 magnitude earthquake, the maximum amplitude of the seismic waves would be very large, and the period would be relatively short. The exact values would depend on the specific earthquake, but typically, the maximum amplitude would be on the order of 10,000 microns and the period would be on the order of 10 seconds. Using these values and a typical value of K = -2, the magnitude can be calculated as: M = log10(10,000/10) - 2 = **7.7**

To calculate the energy released by a 7.7 magnitude earthquake, the following formula can be used: E = 10^(1.5M + 4.8)

Where: E is the energy released by the earthquake in joules: Using this formula and the magnitude of a 7.7 earthquake, the energy released can be calculated as: E = 10^(1.5 x 7.7 + 4.8) = **5.01 x 10^16** joules.

Figure 2. Map of Türkiye's Faults. (Okay and Tüysüz, 1999., Yiğitbaş, 2004., USGS, 2010., Ekinci 2020., Işık, 2020). [15]

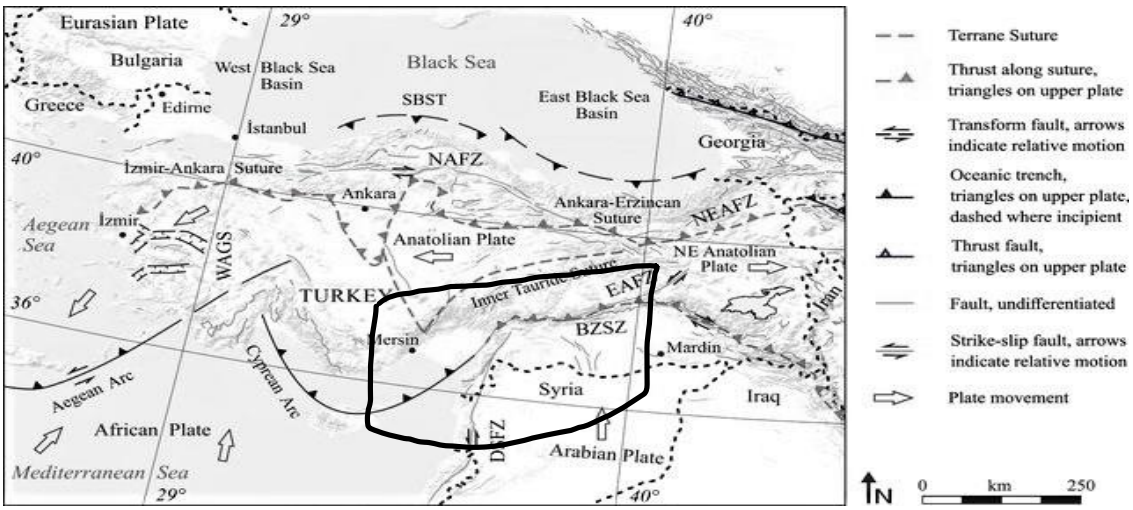


Figure 2. depicts how many faults are compressing the country. The African plate is pushing Türkiye from the south-west to the cyprean arc, while the Arabian Plate [Syria, to the Turkish southern border] also compressing from the South, and the NE Anatolian Plate is pushing the country's tectonics from the East. Therefore, the energy builds where the plates collide from the south and then onward accordingly. Within the oblong highlighted area in the south-eastern Syrian border, the international academic community indeed expected a major quake.

Figure 3. Anatolian Fault activity prior to February 2023 South-East Türkiye Large Seismic Event. Işik, E. et al. (2021) [15]

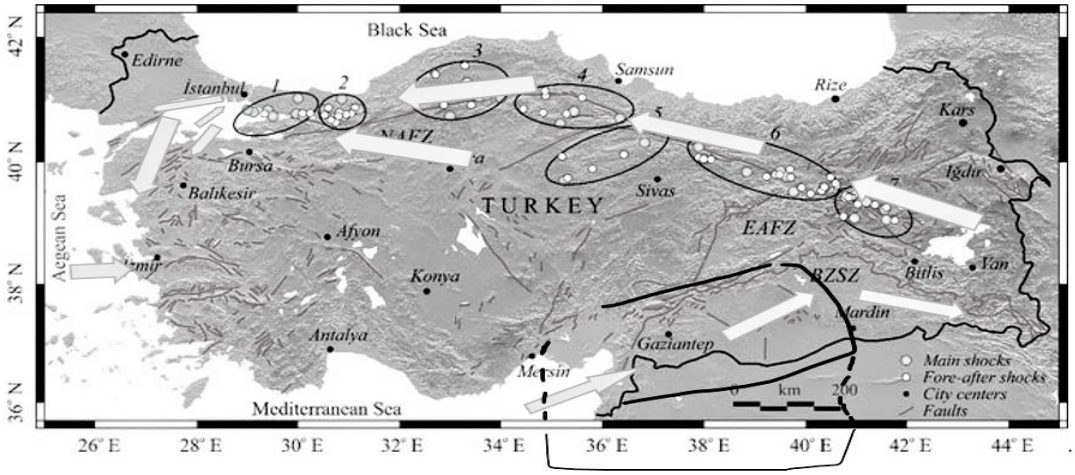


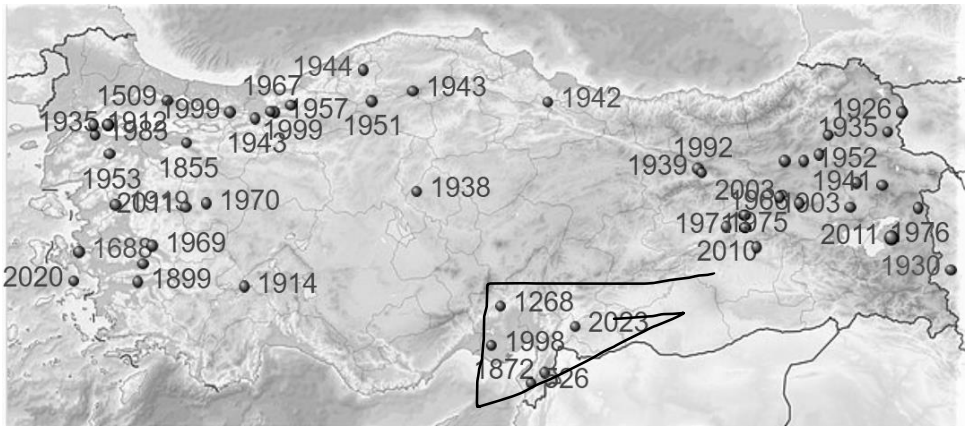
Fig 3. illustrates the northern earthquake activity prior to Feb. 2023 (Highlighted by the arched area) located between 35 degrees East to 40 degrees East, where there are many faults compressed. The areas arrowed, show the directional movement in an anti-clockwise cycle, then reversing. Referring to Table 1. Historical seismic activity Table 1. other factors such as the local geology and fault structure can also affect the number and distribution of aftershocks.

With regards to the aftershocks following the two quakes in southern Türkiye, following February 6, the likelihood of additional building collapses during aftershocks depends on several factors, including the intensity and duration of the aftershocks, the structural integrity of the building, and the quality of its construction. On the other hand, well-constructed buildings that meet modern building codes and have been designed to withstand seismic activity are less likely to collapse during aftershocks. These buildings may have weaker foundations, inadequate bracing, or other structural weaknesses that make them more prone to damage from seismic S-waves.

Overall, it is difficult to generalize about the likelihood of additional building collapses during aftershocks, as it depends on many factors specific to each building and earthquake event. However, it is important to note that aftershocks can pose a significant risk to buildings that have already been damaged or weakened by the initial earthquake, (including Istanbul) and that precautions should be taken to ensure the safety of people in and around these structures.

Finally, to-date, since the Feb. 6 events, there have been approximately 7500+ aftershocks within the vicinity of the same fault experiencing the rupture.

Figure 4. Historic Dates Applied to Geographic with Gaziantep and Kahramanmaraş Events February 2023. Modified - Miller, A.D. (2023).



If we were to relate Table.1 and its historic data for south-eastern Türkiye, [Notated] we can see two significant years for major earthquake activity: in 526 AD under the Byzantine Empire Antakya received a recorded 7.5+ seismic event and Adana 7.0 magnitude event in 1268. Therefore, both Gaziantep and Kahramanmaraş were overdue for a significant and devastating episode in this region's tectonic cycle. Moreover, Geophysicists, Seismologists, and Geologists must have published reported predictions to the relevant Turkish government authorities, and the municipalities ought to have actioned a plan for building regulations and a better authorized early warning plan on par with nations such as Japan. The question why did so many buildings collapsed within each city affected as the history was recorded and volatile regions were discussed? Was it simply since 1999, many regulations were obviously not adhered to, as we reflect on this data stream… To present how two earthquakes together are calculated as one, there is a logarithmic equation to calculate the total affect. the total magnitude of two earthquakes with magnitudes of 7.7 and 7.6, the calculation would be as follows: The magnitude of the combined earthquakes can be found by using the following equation: This may surprise you…

To calculate the total magnitude of the two earthquakes, we use moment of magnitude scale, which calculates energy emitted by an earthquake. For calculation of each total moment magnitude is M_total = 2/3 * log10 (E_total/E_0) - 10.7 where E_total is the total energy released by both earthquakes, and E_0 is a constant equal to 1.0 × 10^7 joules, the energy released by a magnitude 0 earthquake.

To calculate E_total, we can use the following formula:

E = 10^(1.5 * M + 9.1) where E is the energy released in joules, and M is the magnitude.

Using these formulae, we can calculate the total magnitude of the two earthquakes as follows:

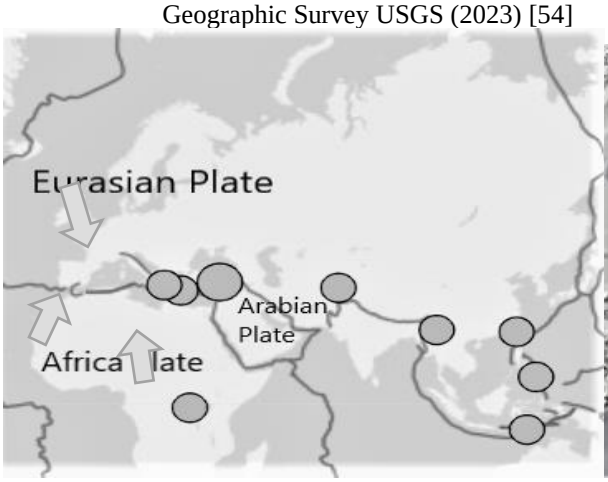
E_total = 10^(1.5*7.7+9.1) + 10^(1.5*7.6+9.1) = 5.62 × 10^18 joules + 3.98 × 10^18 joules

E_total = 9.60 × 10^18 joules

M_total = 2/3 * log10 (9.60 × 10^18/1.0 × 10^7) - 10.7 = **8.0**

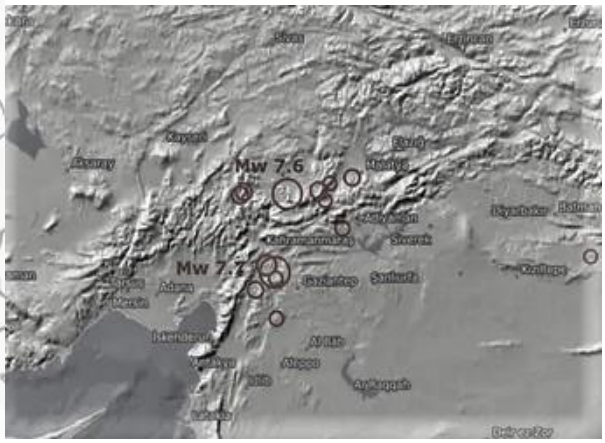
Therefore, the total magnitude of the two earthquakes is approximately 8.0 on the moment magnitude scale. This is a very large earthquake and can cause catastrophic damage. In conclusion, from one's calculations, we can deduce that the Kahramanmaraş and Gaziantep quakes on the very same day, were equivalent to one earthquake of 8.0 in Magnitude. This result confirms the extensive damage experienced in the region. The result of these calculations is a simple one, it is proposed by this academic that new enforced regulations for Türkiye's construction industry be implemented with the countenance of all academics related to this field of research. They must not be ignored anymore, and all domiciles should be built to withstand a 9.0 earthquake as minimum dynamic parametric parameters. One would ask the scientific community how many domiciles are prepared for a magnitude 9.0 quake? Are structural integrity regulations enforced for developers in Türkiye? If the Japanese have a strict regulation in place for its own buildings to withstand a 9.1, there is much for Türkiye and its government to implement, or more people will have their homes as tombs on a regular basis.

Figure 5. Three Plates - Surround Türkiye



Geographic Survey USGS (2023) [54]

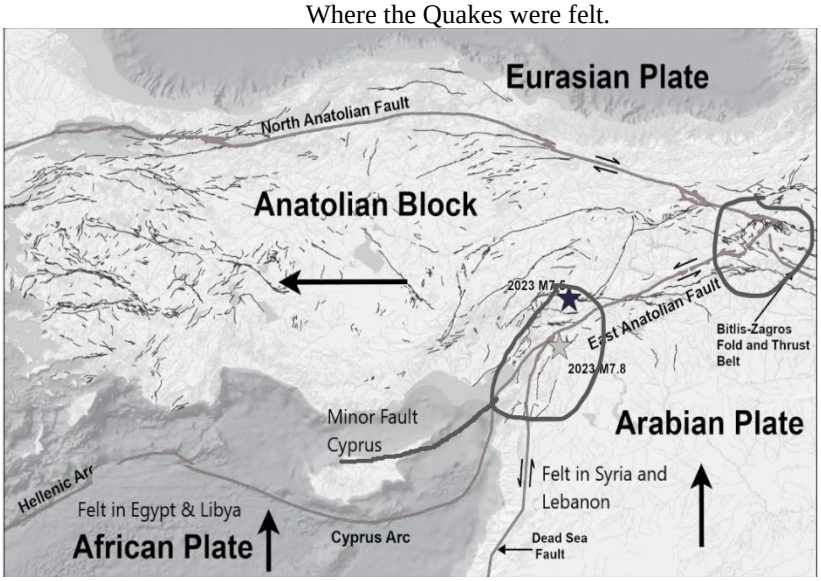
Figure 6. Actual Devastation. Along the fault.



Source: (Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences, 2023). [10]

Referring to *Fig 5*. We can see that Türkiye is straddled between three opposing forces: the Eurasian Plate traversing from the North, the Arabian Plate heading from the south-east, and Africa Plate heading northwards in the Mediterranean. Thus, squeezing the country and building pressure for the plates to slide and to emit a great series of energy bursts to cause small to violent quakes on the surface. However, in *Fig 6*. we can see the very same region of Türkiye notated in Figure 3., that both Gaziantep and Kahramanmaraş experienced tectonic slides that required two cities to emit the built-up energy release that had been waiting dormant for hundreds of years. This emission of high intensity energy created a shock wave that spanned 500 km and was transitioned through the minor faults throughout the tectonics as illustrated in *Fig 7*.

Figure 7. Deformation which led to the Gaziantep – Kahramanmaraş Earthquakes 2023. Where the Quakes were felt.



Source: USGS 2023, Annotated for reader simplicity (Miller, 2023). [54]

Within a complicated deformation zone in southern Turkey, the eastern end of the Cyprus Arc, and northern Dead Sea fault, and western East Anatolian faults meet. The Dead Sea fault and the East Anatolian fault met in the area where the 2023 M 7.8 and M 7.5 earthquakes struck. Both the northernmost section in reference to Dead Sea fault and a large part of the southwestern third of a prominent East Anatolian fault were ruptured by this earthquake series. As the deformation zone is connected to the African Plate, Egypt all the way to Libya experienced the shock waves. A similar episode related to the Arabian Plate, where Syria, Lebanon and as far south as Israel felt the quakes respectively.

The Obvious Question is Why Did So Many Buildings Collapse?

According to Kusunoki Koichi, professor at the Earthquake Research Institute of the University of Tokyo, stated in a recent interview that a 'pancake' effect collapse, leaves no room and time for occupants to vacate these buildings. Koichi pronouncement as the data does not reflect a combined magnitude 8.0 for Türkiye and its working culture, maladministration practices for building regulations. However, further investigation was required regarding Turkish building enforcement or in this case, an aversion of this. Since 1999, Türkiye was promised by the new government that fraudulent activities within the construction industry would be eliminated. Having discussed this with former colleagues in the country of concern, data from a published paper by a Turkish professor at Qatar University, it actually exposed the corruption within the building industry post 1999. A paper on Corruption and Internal Fraud in the Turkish Construction Industry explicitly viewed the whole process of different departments which were subjected to fraudulent acts. [13]. Hopefully this will illustrate a determination for building standards to be better applied in the future, thus eliminating more unnecessary fatalities.

Table 3. Strong Earthquake Comparison between Türkiye's February 6, (2023) and Japan's Great Tohoku Earthquake and Tsunami (2011). Source: National Geographic. (2011)., Reconstruction Agency, Japan. (2022). [41]

Türkiye Gaziantep and Kahramanmaraş Earthquakes. (2023)					Japan Great Tohoku Earthquake and Tsunami. (2011)				
Magnitude	Depth (kms)	Tsunami **M_w**	Buildings Destroyed	Deaths & injured	Magnitude **M_w**	Depth (kms)	Tsunami	Buildings Destroyed	Deaths & injured
7.7 & 7.6	18	None Recorded	**˜170,000**	**˜+45,000 ( )**	9.1	32	**Yes**	121,996	19,729 (6,233)
Shallow Quake			Temp x̄ - 5c		**Shallow Quake**			Temp x̄ -3c	
Statistical Variants to Japan ±					Statistical Variants to Türkiye ±				
- 1.3	-14	No Destructive Tsunami recorded.	**+ 48,004**	**+25,281**	**+ 1.3**	+14	**Tsunami Destroyed the majority of housing.**	-48,004	-25,281
			Temp x̄ - **2c**					Temp x̄ +2c	

Key: **M_w = Surface Wave Richter Scale** **Temp x̄ = Mean Average**

Table 4. Strong Earthquake Comparison between Türkiye's February 6, (2023) and Japan's Great Tohoku Earthquake and Tsunami (2011).[41] **Notable Data Variances**.

Türkiye Gaziantep and Kahramanmaraş Earthquakes. (2023). Slider					Japan Great Tohoku Earthquake and Tsunami. (2011). Subduction				
Magnitude	Depth (km)	Tsunami M_w	Buildings Destroyed	Deaths & injured	Magnitude M_w	Depth (km)	Tsunami	Buildings Destroyed	Deaths & injured
7.7 & 7.6	18	None Recorded	˜170,000	˜+45,000 ( )	9.1	32	**Yes**	121,996	19,729 (6,233)
Shallow Quake			Temp x̄ -5c		**Shallow Quake**			Temp x̄ -3c	
Statistical Variants to Japan ±					Statistical Variants to Türkiye ±				
- 1.3	-14	No destructive tsunami was recorded.	**+ 48,004** Temp x̄ **-2c**	**+25,281**	**+ 1.3**	+14	**Tsunami Destroyed the majority of housing.**	-48,004 Temp x̄ +2c	**- 25,281**

Key: M_w = **Surface Wave Richter Scale** **Temp x̄** = **Mean Average**

Referring to both tables 3 and 4, we can see from the statistics of both nations' disastrous seismic events between 2023 and 2011 respectively, irrespective that Japan experienced a 9.1 earthquake plus a tsunami, it survived much better than the figures from Türkiye. As it can be seen from the seven arrowed data points, Japan experienced a violent tsunami following the huge shock wave from its 9.1 quake. The fact remains that Japan lost ˜ 44% fewer citizens, even though, their housing was washed away by the tsunami, -not the actual 9.1 scaled earthquake. If we were to include a sleeping variable, as the initial 7.7 Kahramanmaraş, quake struck at 04:17, and in the afternoon as Japan's 9.1 struck Tohoku at 14:26, but people were still in buildings like schools and places of work, and we could still never account for why so many Turkish structures in 13 cities were raised to the ground and why so many lives were lost.

Differences of Energy Release from the two Earthquakes

If we were comparing two earthquakes in terms of shaking, then should minus one magnitude from the other and increase 10 to that power: 10^(M1-M2). Therefore, a difference from initial quakes is as follows:

Equation: USGS Model.

10^(M1-M2) = 10^ (9.1-7.7) = 10^1.4 = **25.118** ∴ 9.1 Quake is **25.1 times** more However, if we were to use the same mathematical model but to insert the 8.0 combined factors, The difference between a 7.7 earthquake and an 8.0 earthquake is mainly in amount of energy actually released. Thus, magnitude of a quake is attributed to same logarithmic scale as previously notated, which means that each rise in magnitude by a unit represents a **tenfold raise** ground amplitude motion and a **32-fold increase of energy emitted.**

So, an 8.0 earthquake would release about **ten times the power** than a 7.7 earthquake. Additionally, shaking concentration and duration of an 8.0 event, would likely be greater than that of a 7.7 earthquake, potentially resulting in more widespread and severe damage. However, the specific effects of an earthquake depend on a variety of factors, including the distance from the epicentre, the depth of the earthquake, and the type of soil or rock within the specific area. The longer the fault, the longer and stronger would be a seismic event.

This posed the question, how could an earthquake region hit by a 9.1, [25.1 times more powerful] than a 7.7 or 8.0 combined, have fewer casualties and fewer structures destroyed prior to the tsunami? As Türkiye had no tsunami but still managed to lose 44% more of its citizens inclusive of 48,000 more structures than Japan. A further interesting question to pose; is what would be the total loss of buildings in Japan in 2011, if they hadn't experienced a tsunami?

The environment minister, Murat Kurum, had stated from his initial assessment of some 170,000 buildings across the south of the country. 24,921 of these had either collapsed or were rendered ruined by the quake. (Henley, 2023).

Following the Great Japan quake, freezing winds, hailstorms and dense snow were a danger for 430,000 besieged survivors of northern Japan's seven-day cascade of calamities., i.e., an enormous earthquake, overwhelming tsunami and nuclear predicament, many people who were displaced had faced temperatures of –5C. [57].

According to a report published by the US Geographic Survey, "hallow seismic events are classified 0 to 70 km deep; intermediate earthquakes, 70 - 300 km deep; and deeper quakes, 300 - 700 km in depth. In addition, the scientific term "deep-focus earthquake, is applied to movements at a depth of 70 km or more. These deeper than 70 km remain within great slabs of lithosphere or geosphere that are tumbling into the Earth's mantle." [46]

Further findings of this were their detection in 1922 by Turner from Oxford, England. Previously, earthquakes had illustrated shallow focal depths. Existence of deep-focus seismic activity was corroborated in 1931 from studies with the application of seismograms of several tectonic events which in turn led to the development of travel-time curves for intermediate and deep quakes.

[46]. This leads to the next section to evaluate how Japan is paying more attention to its citizens' safety via its construction of its domiciles.

How Powerful were the Kahramanmaraş, and Gaziantep Earthquakes Generally?

Additional Notation: Hiroshima Energy Equivalent Using the Moment Magnitude Scale in Joules.

As it is not possible compare the energy released by an earthquake to the energy released by a nuclear-atomic detonation, nevertheless, it is possible to approximate the energy released by an earthquake using the moment magnitude scale, which is a measure of the energy released by an earthquake related to the amplitude of the seismic waves generated. (Hanks, 1979).

However, if we were to use a more accurate seismic moment scale: The formula M0 = μAD relates to seismic moment, which is a measure of the total energy released by an earthquake. The formula is commonly attributed to the American geophysicist Charles F. Richter, who developed the Richter scale for measuring earthquake magnitude in 1935.

For more context, an earthquake with a magnitude of **8.0** is considered an extraordinarily strong earthquake and can cause extensive damage to buildings, infrastructure, and communities. The amount of energy released during an earthquake is a measure of its strength, and it can be calculated using the seismic moment formula:

$M0 = \mu AD$

where M0 is the seismic moment, μ is the shear modulus of the rocks in the fault zone, A is the area of the fault that ruptured during the earthquake, and D is the average displacement on the fault.

For an earthquake with a magnitude of 8.0, the seismic moment is approximately 1.0 x 10^21 Nm (Newton Metres). This corresponds to an energy release of 6.3 x 10^18 joules, which is equivalent to the energy released by the explosion of over **1,500** atomic bombs like the one that was dropped on Hiroshima in 1945, ending World War II. Therefore, this was a significant seismic event and Turkish seismology related academics stipulated that a huge series of tremors could be experienced by the region of south-eastern Türkiye one day… Was the warning headed...?

Modifications have been made to this equation, and some institutions are using it this day. [52] *A review and upgrade of the lithospheric dynamics in context of the seismo- electromagnetic theory.*

Japanese Building Regulations in Detail[3]

In fact, revisiting the current Turkish President Recep Tayyip Erdoğan, came to power via his AK Party, (Conservative Party) following the said 1999 earthquake with many given promises within his campaign.

Relating to the Japan question, this land of the rising sun, has made great scientific and structural engineering strides since experiencing a multitude of on-going seismic activity, as its location is on the notable "Ring of Fire".

With thanks to a housing realtor company located in Tokyo, alike all others, they publish regulations and advise its clientele while they are searching for their first home. It is the grade of the Housing Performance Classification System used with the Housing Quality Assurance Promotion Act (Housing Quality Assurance Act) enforced in 2000. Housing Performance Labelling System is an arrangement in which a third-party organization authorized by the Minister of Land, Infrastructure, Transport and Tourism objectively evaluates the performance of a house based on ten principles and permits home buyers to compare the performance of houses according to unified standards. The Seismic Grade assesses housing by dividing the quake-resistance performance of a house into three levels of the seismic grade based on two indices of damage prevention and prevention of collapse. (Plaza Homes, 2022). Indeed, there are three grades of housing issued by the Japanese government within its building standards and therefore its compliance is absolute.

What is Building Collapse? Generally, it means a performance level seismologically, where human life is safeguarded even if the damage is received from a quake that could occur infrequently. (Plaza Homes, 2022). Allow this author to take you through the three grades of safety mentioned previously, however, in more structured detail using this basic tabulation 5.

Table 5. Three Categories of Seismic Grades Applied to the Buildings in Japan from 2022.

SEISMIC GRADE 1. **Ordinary Homes** **Same performance level stipulated by the building act.**	**SEISMIC GRADE 2.** **Schools, Hospitals** **Resistance level of 1.25 times as much as grade 1.**	**SEISMIC GRADE 3** **Fire and Police Stations** **Resistance level of 1.50 times as much as grade 1.**
Seismic Grade1 is the same performance level as the earthquake resistance standards stipulated by the Building Standard Act. It is a quake-resistance performance that buildings are almost not damaged by an earthquake with JMA seismic intensity scale of 5+, and do not collapse even in an earthquake with the same scale of 6+ to 7. Buildings, however, are damaged by an earthquake with the scale of 6+ or higher to the extent that those need to be rebuilt.	Seismic Grade 2 is the quake-resistance performance level that buildings can withstand an earthquake 1.25 times as much as the same performance level that is assumed by Seismic Grade 1. In order to be designated as an evacuation place in the event of a disaster, such as a school or hospital, it is necessary to have Seismic Grade of 2 or higher. With Seismic Grade 2, buildings may be damaged by an earthquake with the seismic intensity scale 6+ to 7, but the damages are considered repairable. With Seismic Grade 2 or higher, the buildings can be certified as "Long-life quality housing". Long-life quality housing is a house that is designed to live safely and comfortably for a long period of time, and you can receive various tax incentives.	Seismic Grade 3 is the quake-resistance performance level that buildings can withstand an earthquake 1.5 times as much as the same performance level that is assumed by Seismic Grade 1. This grade level is required for fire stations and police stations that serve as the centre for reconstruction and first-aid activities in the event of a disaster. With Seismic Grade 3, buildings may be damaged by an earthquake with the seismic intensity scale 6+ to 7, but the damages may be minor and are considered repairable.

Sourced: (Plaza Homes, 2022). Tokyo

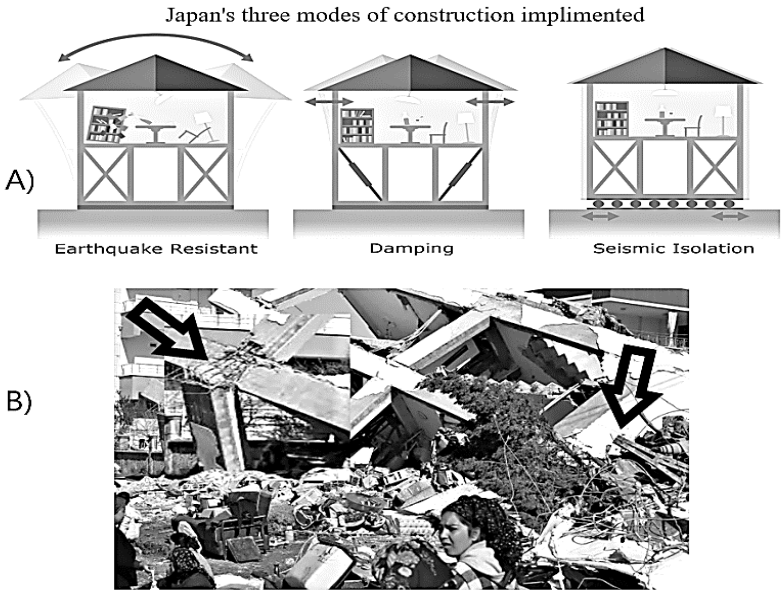
Earthquake Resistance in Japan in Reference to Well-defined Building Structure **[39].**

Earthquake Resistance in Japan in Reference to Well- defined structure Earthquake Resistance This is the most typical earthquake- resistant structure for detached houses in Japan. The new Anti-Seismic Structure Standard authorizations that all structures constructed after 1981 have an earthquake- resistant structure. Main structure structures, similar as posts, walls, and bottoms, can absorb seismic movements thanks to seismic resistance structures. **Structure Damping** walls that absorb seismic energy are constructed within the structure to reduce seismic stir. The Active type of damping structures makes use of energy like electricity, whereas the Passive type makes use of physical forces. Damping structures can reduce seismic intensity by 70- 80 in comparison to structures that are resistant to earthquakes.

Rigid Structure (erected strictly to help collapse) and Flexible Structure(erected with the main structural factors bowing flexibly to spread the force of seismic movements) are two types of structures.

Seismic insulation Structure These structured houses retain earthquake- absorbing bias(anchorite) like laminated rubber that help seismic movements from reaching the structure. It's generally used as part of the foundation for high- rise structures. Lead, springs, mutes, ball comportments, and laminated rubber are all exemplifications of bias that absorb earthquakes. also, a combination of these accoutrements is used in recently developed construction ways. When compared to earthquake- resistant structures, seismic insulation structures can reduce seismic intensity by as little as one- third to one- fifth(lower than half). [39]

Figure 8. Comparison between the Japanese Regulations to Türkiye. Sourced: (Kenyon, 2023). [20]



South-eastern Türkiye following 2 Earthquakes. (2023)

Results and discussion[4]

Table 6. Türkiye – Japan Comparison over the Past Five Major Earthquakes Tabulation since 1995.

Türkiye's Last Three Prominent Earthquake Events					Japan's Last Three Prominent Earthquake Events				
Date	Region	Depth	Magnitude	Deaths	Date	Region	Depth	Magnitude	Deaths
6/2/2023	Gaziantep	18 km	7.7	Total *2	16/3/2022	Fukushima	63 km	7.3	4
6/2/2023	Kahramanmaraş	17.9 km	7.6	45,000	13/2/2021	Fukushima	49 km	7.1	1
10/3/2022	Samos-Izmir	21 km	7.0	117	13/2/2021	Honshu + Ts	24 km	9.1	19,729
2/11/99	Düzce	54 km	7.2	18,373	26/5/2003	Honshu Iwate,	33 km	7.0	0
17/8/99	Gölcük - Kocaeli	39 km	7.4	1,000	16/1/1995	S.W. Honshu	52 km	6.9	5,502
24 years	**5 Regions**	**x̄ 29.9**	**x̄ 7.38 Mw**	**x̄ 12,898**	**27 years**	**4 Regions**	**x̄ 44.2**	**x̄ 7.48 Mw**	**x̄ 5,047.2**

From Table 6., it is clear to see that Japan has improved its building regulations from the instruments used in the table for more clarification and data correlation. The five regions for each nation were the closest in chronology to attain significant comparisons in event data [24-27] years respectively. The last row indicates the averages x̄ for the individual outcomes for both countries. It is also shown from the data that both Türkiye and Japan had similar values for magnitudes and hallow quakes (Shallow depths) thereof. The noticeable element here was the death toll over the years; 12,898 for Türkiye and only a mere figure of just over 5,000 fatalities in Japan's Pacific regions. If the second huge Japanese earthquake were used within a more distinct variable, we would see that the casualties would have been far less, if Honshu had not experienced the tsunami which caused more damage than the quake itself. In summary, it is clearly evident from this data that Türkiye has much work to do to protect its citizens within its construction regulations mandate. As it can be seen, ten different notable events over the course of two decades were used within the tabulation itself, thus, removing any doubt and reason for error.

Are Top Tier Turkish Academics being ignored by their own Government?

As this exploration had progressed, a familiar theme was being untangled from the data pertaining the Turkish Government's rebuff to accept the numerous experts' suggestions within the academic fields portrayed to the thesis of this paper. The government removed, 15,000 civil servants and varied academics from the ministry of education, 257 staffers from the high minister's office, and 492 clergy from the department for religious affairs. It came after nearly 8,800 police officers were fired, 6,000 troops were detained, 2,700 judges and attorneys were arrested, dozens of governors were detained, and more than 100 generals, or roughly one-third of the general corps, were detained.
(Kingsley, 2016). These events had initiated fear within academe. Since this ignominious time, notable professors have been stifled to both advise this new governance or follow the same narrative, inclusive of lecture scholars within their academic disciplines. Additionally, due to recent emendations in certain laws, academe lost its voice. For further on these radical laws involving social media and so on please relate to the listed citation following this judgment. [56].

Reconsidering the exploration content, according to Seyla Benhabib, Yale University's Eugene Columbia Law School; This corruption can be seen in the many questionable construction contracts that the government approved despite stricter regulations that were put in place following the 1999 Izmit earthquake. However, the disaster has also stressed a rift between the nation's scholars and scientists towards the government, built on discourteousness and misprision for knowledge. [23]

As result of the Turkish president's war on academe and the silencing of academic debate, this has left the best and trustworthy cited Criminal Law Professors, Geologists, Geo-physicists, Earthquake Engineers, Construction Engineers etc., perplexed and very annoyed. A noted Turkish criminal law expert aired is disapproval in public by stating " We cannot do our work effectively, so many died, there is fear throughout the universities, building standards are being illegally neglected and nothing has progressed since 1999..." [42]. The question to be asked within this study, if a nation does not listen to their internationally renowned experts in many fields relative to this tragedy, how could Türkiye both recover and move on to more to strict building regulations? explains one' s theory entitled Eight Dominions to Dystopianism which explains how governments are influenced by the West, initialized within education. For the complaints by academics referred in this study, the eighth dominion relates to Turkish academe also, the same dominion refers to creating a Centralization of Government: Educational, Economic, Welfare and Health. [31].

Author's Academic Statement

To conclude this element of this research draft, one has been very involved within this study due to Türkiye being alike a second home for this researcher, both prior to Recep Tayyip Erdoğan's presidency, and for a short time thereafter. One vowed to not return to Türkiye (at personal sacrifice) within higher education until his stewardship was indeed over. Hence, this tragedy has reinforced one's desire to assist this country by the conducting of this vital research.

Scientific Discussion[5]

Standard Deviation Deaths Caused & Margin of error between the Magnitude of Earthquakes of Türkiye and Japan
Difference in Error – Sampled Data & Population Data?

The conception of standard divagation was developed by a French mathematician named Abraham de Moivre in the early 18th century. still, the ultramodern formula for calculating standard divagation was developed latterly by mathematician named Carl Friedrich Gauss in the late 18th century. Gauss is often credited with the development of standard divagation because he not only deduced the formula, but he also considerably used it in his work on probability proposition and statistics.

i) Sample Data Stream:

Samples, N: 2
Sum of, Σx:17945
M, x̄: 8972.5
Var, s^2: 30819100.5

$$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \overline{x})^2},$$

$$S2 = \frac{\Sigma(x_i - \bar{x})^2}{N - 1}$$

$$= \frac{(12898 - 8972.5)^2 + ... + (5047 - 8972.5)^2}{2 - 1}$$

$$= \frac{30819100.5}{1}$$

$$= 30819100.5$$

$$s = \sqrt{30819100.5}$$

$$= 5551.4953390956$$

Standard Deviation, s: **5551.5** which correlates with Japan's data on deaths in Table 6.

Margin of Error - Confidence Interval

The sampling mean follows a normal distribution. In this case, the standard error of the mean (SEM) can be calculated using the following equation:

$$s_{\bar{x}} = \frac{s}{\sqrt{N}} = \mathbf{3925.5}$$

Therefore, the margins or indeed confidence degrees to SEM. Generally, for data illustrates a confidence level of 95% a significance of 5% is utilized, depending on research fields.

Table 7. Türkiye & Japan Margins of Error and Confidence levels for its Seismic Activity Outcomes.

Confidence Level	Margin of Error	Error Bar
68.3%, $s_{\bar{x}}$	8,972.5 ±3,925.5 (±43.75%)	
90%, 1.645$s_{\bar{x}}$	8,972.5 ±6,457.448 (±71.97%)	
95%, 1.960$s_{\bar{x}}$	8,972.5 ±7,693.98 (±85.75%)	
99%, 2.576$s_{\bar{x}}$	8,972.5 ±10,112.088 (±112.70%)	
99.9%, 3.291$s_{\bar{x}}$	8,972.5 ±12,918.821 (±143.98%)	
99.99%, 3.891$s_{\bar{x}}$	8,972.5 ±15,274.121 (±170.23%)	
99.999%, 4.417$s_{\bar{x}}$	8,972.5 ±17,338.934 (±193.25%)	
99.9999%, 4.892$s_{\bar{x}}$	8,972.5 ±19,203.546 (±214.03%)	

ii) Population Data Stream:

SD, σ

N: 2
Σx: 17945
μ: 8972.5
Var, σ^2: 15409550.25

$$\sigma = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \mu)^2}. \quad [27]$$

$$\sigma^2 = \frac{\Sigma(x_i - \mu)^2}{N}$$

$$= \frac{(12898 - 8972.5)^2 + ... + (5047 - 8972.5)^2}{2}$$

$$= \frac{30819100.5}{2}$$

$$= 15409550.25$$

$\sigma = \sqrt{15409550.25}$

$= \mathbf{3925.5}$

Margin of Error - Confidence Interval

A sampling mean follows a normal distribution. Thus, this standard error of the mean (SEM) can now be calculated using the following: $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{N}} = 2775.7476695478$

Confidence intervals are now achieved at different confidence levels. Depending on the field of study.

Table 8. Japan Margins of Error and Confidence levels for its Seismic Activity Outcomes.

Confidence Level	Margin of Error	Error Bar
68.3%, $\sigma_{\bar{x}}$	8,972.5 ±2,775.748 (±30.94%)	
90%, $1.645\sigma_{\bar{x}}$	8,972.5 ±4,566.105 (±50.89%)	
95%, $1.960\sigma_{\bar{x}}$	8,972.5 ±5,440.465 (±60.63%)	
99%, $2.576\sigma_{\bar{x}}$	8,972.5 ±7,150.326 (±79.69%)	
99.9%, $3.291\sigma_{\bar{x}}$	8,972.5 ±9,134.986 (±101.81%)	
99.99%, $3.891\sigma_{\bar{x}}$	8,972.5 ±10,800.434 (±120.37%)	
99.999%, $4.417\sigma_{\bar{x}}$	8,972.5 ±12,260.477 (±136.65%)	
99.9999%, $4.892\sigma_{\bar{x}}$	8,972.5 ±13,578.958 (±151.34%)	

iii) Initial Sampling vs Populated Methods for Margin of Error and Confidence levels pertaining the Analytics.

Table 9. Türkiye vs Japan Margins of Error and Confidence levels for its Seismic Activity Outcomes.

Confidence Level	Margin of Error	Error Bar
68.3%, $s_{\bar{x}}$	8,972.5 ±3,925.5 (±43.75%)	
90%, $1.645s_{\bar{x}}$	8,972.5 ±6,457.448 (±71.97%)	
95%, $1.960s_{\bar{x}}$	8,972.5 ±7,693.98 (±85.75%)	
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99.999%, $4.417s_{\bar{x}}$	8,972.5 ±17,338.934 (±193.25%)	
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99.999%, $4.417\sigma_{\bar{x}}$	8,972.5 ±12,260.477 (±136.65%)	
99.9999%, $4.892\sigma_{\bar{x}}$	8,972.5 ±13,578.958 (±151.34%)	

It can be seen that the confidence levels for Turkiye surpass Japan for more seismic activity.

iv) *Earthquake Standard Deviation of the mean between Türkiye and Japan*

N: 2
Σx: 14.86
$\bar{x}$: 7.43
Var, s^2: 0.0050000000000001

$$s = \sqrt{\frac{1}{N-1}\sum_{i=1}^{N}(x_i - \overline{x})^2}, \quad [27]$$

$$s^2 = \frac{\Sigma(x_i - \bar{x})^2}{N - 1}$$

$$= \frac{(7.38 - 7.43)^2 + \ldots + (7.48 - 7.43)^2}{2 - 1}$$

$$= \frac{0.0050000000000001}{1}$$

$$= 0.0050000000000001$$

$$s = \sqrt{0.0050000000000001}$$

$$= 0.070710678118655 = \mathbf{0.07}$$

Margin of Error - Confidence Interval

Sampling mean follows - normal distribution. Standard error of the mean (SEM) in this situation:

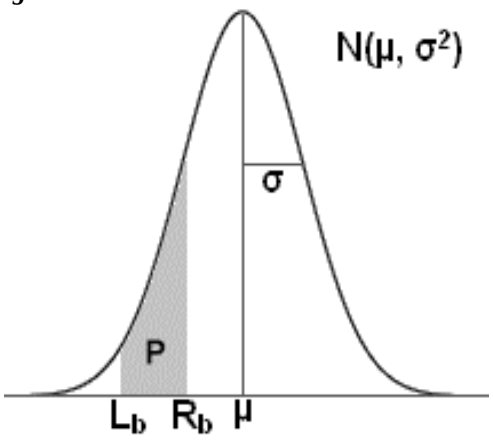
$$s_{\bar{x}} = \frac{s}{\sqrt{N}} = \mathbf{0.05}$$

v) Probability of Normal Distribution of Earthquakes considering Mean between Türkiye and Japan.

Table 10. The probability between (-1 Türkiye's Seismic Activity and 1 Japan)
- Confidence - Intervals & Range.

Confidence	Range	n
0.6828	-0.10000–14.86000	1
0.80	-2.20601–16.96601	1.281551565545
0.90	-4.92351–19.68351	1.644853626951
0.95	-7.28053–22.04053	1.959963984540
0.98	-10.02108–24.78108	2.326347874041
0.99	-11.88720–26.64720	2.575829303549
0.995	-13.61661–28.37661	2.807033768344
.998	-15.73494–30.49494	3.090232306168
0.999	-17.23314–31.99314	3.290526731492
0.9999	-21.72163–36.48163	3.890591886413
0.99999	-25.66046–40.42046	4.417173413469

Figure 7. Confidence Interval Mean Curve



The probability between -1 and 1 is **0.065557** The probability outside of -1 and 1 is 1 - 0.065557 = **0.934443**
The probability of -1 or less (≤ -1) is **0.13129** The probability of 1 or more (≥ 1) is **0.80315**

vi) Geometric Mean Used as a Valid Mathematical Instrument

Using Euler's geometric mean involves the sum of the values in a set to denote central tendency, the geometric mean is a sort of average used in mathematics. The arithmetic mean, on the other hand, does the same task by summing the values in the set rather than their products. The geometric mean is helpful when values being compared have a wide range, which is exactly what would happen if the 9.1 Earthquake-Tsunami that struck Honshu in 2011 were to be used as a prime variable.

Table 11. Geometric Mean Tool used for a Larger Proportionate variable as Honshu 2011, included within all Ten Earthquake intervals and Magnitudes $\mathbf{M_L}$. [59]

Türkiye

$$\left(\prod_{i=1}^{N} x_i\right)^{1/N} = \sqrt[n]{x_1 x_2 x_3 \dots x_n} = \mathbf{M_L}$$

Count	5
Sum	36.9
Mean (Average)	7.38
Median	7.4
Mode	All values appeared just once.
Largest	7.7
Smallest	7.0
Range	0.7
Geometric Mean	7.3755313735992
Standard Deviation	0.25612496949731
Variance	0.0656
Sample Standard Deviation	0.28635642126553
Sample Variance	0.082

Japan

Count	5
Sum	37.4
Mean (Average)	7.48
Median	7.1
Mode	All values appeared just once.
Largest	9.1
Smallest	6.9
Range	2.2
Geometric Mean	7.4389895115187
Standard Deviation	0.82073138114733
Variance	0.6736
Sample Standard Deviation	0.91760557975636
Sample Variance	0.842

Sorted Data of Magnitude - 7.0, 7.2, 7.4, 7.6, 7.7 Türkiye
Sorted Data of Magnitude - 6.9, 7.0, 7.1, 7.3, 9.1 Japan

Delineation of the Results

Firstly, the results the sample variance as exact, thus an accurate progression could be made in respect of the two nation's seismic events. i) Türkiye's sum of data 36.9 was affected due Japan experienced more higher variables portrayed, due to experiencing more factors within its quake owing to the tsunami. ii) For earthquake energy release, the Geometric Mean aided in the mediation of the main difference between the 9.1 and 7.7 magnitude deviation variable. iii) The range was 2.2 for Japan and 0.7 for Türkiye for difference of overall event factors, therefore Japan's overall variables experienced were far greater than those of Türkiye. iv) The geometric calculation level the weightings more appropriate for the sums introduced at = magnitudes separated by 7.38 – 7.44 respectively leaving the average magnitude variance was = +0.06 favouring Japan. v) However, SD, the variance and sample SD figures showed that Japan overall had experienced the worst events however, with very little structural damage prior to the resulting tsunami. [36].

Arithmetic Conclusion:

It is clear from the logarithmic tabulations and SD results inclusive of the geometrics, in Table 11. delineated, we cannot avoid the fact that Japan's earthquake magnitudes were more severe in comparison to Türkiye, nevertheless, Japan's infrastructure survived the 9.1 seismic event only to destroyed by the resulting Tsunami.

Türkiye, therefore, has proven from these results, had no room for error during this recent quake on February 6, 2023. Without a tsunami as Japan experienced, how could so many fatalities have occurred inclusive of the number of buildings destroyed. These magnitude results would not have been made logical, if there were a government building enforcement provision in place following the events of August and November 1999.

Indeed, many buildings were destroyed as a result of their age, (being built before the mid-1980s) however, Japan's buildings remained intact following a much larger episode. Obviously, Japan has subduction quakes as per the region, nevertheless, the earthquakes that hit Türkiye were shallow, which were as strong as in Japan's recent history, nonetheless, Turkey loses more buildings and lives accordingly. In conclusion the data is irrefutable, and the recommendation of this paper to Türkiye, is that new strictly enforced building regulations be implemented for all structures apartments, schools, hospitals, office buildings, places of worship, shopping malls and entertainment facilities, to be able to experience a 9.0 magnitude quake on the Richter Scale. - irrespective of those in power governing the country.

Psychosocial Impact on Survivors[5]

Following a natural catastrophe, such as an earthquake, the populace is more prone to experiencing psychological and psychiatric disorders. A mental health condition Post-Traumatic Stress Disorder (PTSD), which is usually activated by life-

threatening or other dangerous situations and experiences, is the most commonly documented [35]. In addition, symptoms need to be distressing or functionally impairing for more than a month in order to meet requirements for the PTSD diagnostic. It is necessary for symptoms to last for more than a month, to cause the individual experiencing them pain or functional impairment, and to not be caused by other negative traits and activities and drug usage, or other conditions. [2]. The prevalence of PTSD after earthquake exposure varies between research and ranges from 4-6 in percentage. [48]. The community examined, the age categories taken into consideration, the amount of time that has passed since the stressful incident, the sample size, and the study design are all factors that contribute to this diversity. Since mental health is ongoing, it is correct to assume that a community that has been subjected to a natural catastrophe cannot be divided into two groups, one with clearly defined psychological disorders, and the other without any such disorders.

There was an intriguing study conducted on how children would respond to such a seismic as endured in southern Türkiye. A study on family environment and youthful children's responses to earthquake in 2007. The exploration notated the following findings Children's vulnerability to different stresses can be told by their family setting, but little is known about how family dynamics affect how children respond to natural disasters. The styles involved were that seventeen two- parent homes who had children between the periods of 4-5 at the launch of this study were participants. The earthquake experience had varying degrees of effect on the homes. compliances of parents' positive and negative conduct during a parent- child play assignment accounted for the pre-earthquake family setting. Noted were the signs of children's anxiety and maternal solicitude eight months after the earthquake. The results illustrated that there was a modest correlation between the effect of the earthquake and children's anxiety symptoms (r = .44), but the association was eased by pre-earthquake family conduct. For homes where fathers displayed high situations of negative behaviour whereby girls or mothers displayed low situations of positive behaviour with boys, the quantitative response in relationship between the effect of earthquakes and the symptoms endured by children did not hold. Additionally, findings in line with complete agreement for boys (and partial agreement for girls) suggested that reported maternal stress was the middleman for 86 of the overall effect of the seismic impact on boys(and 29 on girls' stress elements).

These results showed that the character of the parent-child bond before a young child responds to an abrupt, unfavorable environmental occurrence, such as an earthquake.[40]. Neither being a professional psychologist nor psychiatrist, this aforementioned study could be relevant to the children of one's research related to the February 6 traumatic events in Türkiye.

An affiliated study following the major 2015 Nepal Earthquake, this time conducted with adolescents. This exploration had three major findings; this study showed no significant change in the frequency of PTSD and depressive symptoms among adolescents from 18 to 31 months after the earthquake. Second, living in an oppressively affected area and exposure to trauma after the earthquake was associated with PTSD and depressive symptoms at 31- month follow-up. Third, when the sample was divided grounded on the stability of symptoms into four groups(adaptability, recovery, delayed and habitual), living in oppressively affected areas and trauma exposure after the earthquake prognosticated those who developed habitual PTSD or depressive symptoms across time, as well as those who developed delayed PTSD or depressive symptoms. [45].

In conclusion to this section, as the Turkish population has reflected on the earthquakes and their consequences, now they are traumatized nationally in respect to the condition of their own apartments and houses. Children especially depend on routine like schooling, activity, and mealtimes, with more of a degree for children afflicted with ADHD or Autism. However, the parents need more direct therapy for the adult stresses experienced, as described experiencing form of PTSD as children feed off the parental behaviour and their individual traits.

Earthquake Early Warning Systems[5]

Japan

As a known Earthquake area with continually active faults, Japan has already learned its lessons regarding substandard building regulations. Now these are in legal order, it has researched into possible early warning systems to further alert all concerned in an event of a seismic emergency.

Firstly, the Great East Japan Earthquake of March 2011 exposed inaccuracies in Japan's earthquake early warning system, and the system was improved to give quicker, more accurate warnings of the types of earthquakes that are about to strike. The technology sends out alerts in advance of powerful seismic tremors. Despite being introduced in 2007, the east Japan Kanto region did not receive warnings during the 2011 earthquake because of the seismic intensity in the area was overestimated, and detailed accuracy issues. A decade later, its accuracy had increased, making the device more useful. [50].

In the Ibaraki Prefecture city of Tsukuba, the National Research Institute for Earth Science and Disaster Resilience (NIED), the hub of Japan's disaster prevention research, had installed observation systems that had included seismometers and tsunami sensors in the Pacific where it is thought that large earthquakes, such as trench-type temblors, could occur.

The observational S-net, which contains 150 devices connected by approximately 5,500 kilometers of underwater cables, monitors, and checks in detail both the Kuril and Japan Trenches off the coast of eastern Japan. The Nankai Trough quake was expected to strike in the waters near the Kii Peninsula and Shikoku Island in west Japan, and DONET, which situated fifty-one observation devices, monitors those areas. [50].

Figure 8. S-net observational sensor equipment is lowered into the Ocean.

Source: Research Institute for Earth Science and Disaster Resilience [50].

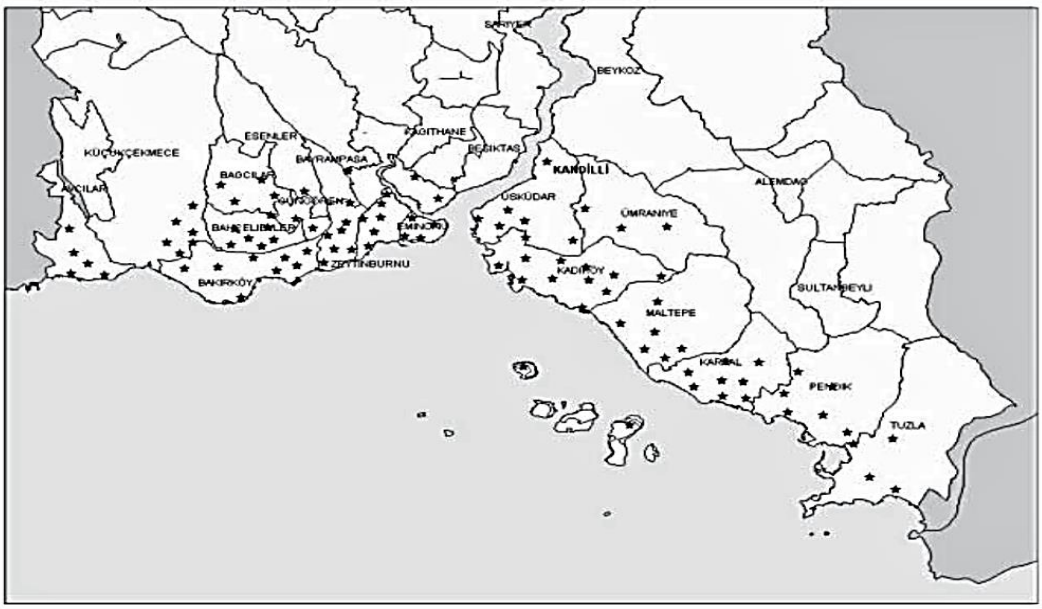
Since 2020, private businesses are now able to predict long-period ground movements thanks to changes to the Meteorological Service Act. In collaboration with more than ten businesses and academic institutions, including an app developer and a building company, the NIED has carried out demonstration tests. The information is designed to be used for things like sending out longer ground motion alerts signals digitally with an app and operating lifts during quakes. The emergency management offices of structures are able to guarantee safety by using forecasts of the earthquake levels on each floor from Tokyo-based IT company RC Solution Co.

The results of this technology could discern when a quake could arrive with the first wave prior to the main slower wave strikes. Close to the epicentre is around 15 seconds warning, further away possibly 30-40 seconds. At least the populous could vacate their domiciles in time.

Türkiye

The only system in evidence in Türkiye is located in the city of Istanbul where sensors are in place in vulnerable areas of a possible direct hit. The stars denote stations.

Figure 9. Locations of the Motion Detector Stations Istanbul. (Erdik, 2003).



Source: Istanbul Earthquake Rapid Response and the Early Warning System. (Springer, 2003). Bulletin of Earthquake Engineering. [8].

A dense motion connection system has been installed in Istanbul to help lessen potential damage from a disastrous earthquake. Two separate networks are included within the Istanbul Earthquake Rapid Response and Early Warning System (IERREWS), which offers pre-quake warning and post-quake rapid response. To generate data for Rapid Response, one hundred durable motion sensors are deployed in Istanbul's metropolitan region of vastly populated areas (Figure 9). In order to provide earthquake Early Warning, an extra ten more stations are placed as near as possible to the Great Marmara Fault. With the administrative assistance of the Governorate of Istanbul, Army Command, and Istanbul's municipality, IERREWS is created and to be ran by Bosphorus University. Moreover, system's construction was initiated by the GeoSig Inc organization. [8]. Unfortunately, no sensors are located beneath the sea as in Japan. Only Istanbul is the concentration currently. Consequently, only a 4 second warning will be available within these stationed systems of monitoring.

Controversy in Earthquake Prediction.

In reference to this subject matter, it was noticed in the Turkish media that many of its academic contributors like to entertain the public with predictions and possible eventualities following seismic events. These notable array of earthquake engineers, structural engineers and so on compete with each other for their respective notoriety, at the expense of the already traumatized citizens. The question here is whether earthquakes can be predicted? This researcher was very skeptical with this notion. Following the analysis from many academic lectures on this topic, there was no clear indicator one way or the other.

Therefore, one reached out to world renowned seismologist Dr. Lucy M. Jones of the Jones Center for Science and Society, who has been affiliated with the U.S. Geological Survey for many decades. She kindly responded furnished this study with a valuable insight into earthquake prediction via many of her lectures and podcasts. The extent of the information provided was calculated, measured, logical and within scientific reasoning.

Within the highlights in what Dr. Jones indicated that there was no grounding in science to predict future earthquakes. As she once knew the legendary seismologist Charlie Richter (Originator of the magnitude scale) he himself once said that academics who had believed that they could foresee quakes were charlatans. Dr. Jones elucidated that many of the earthquakes previously were predicted following a main event only, and the pre-shocks were no indicator of impending quakes with certain individual magnitudes. These foreshocks as she further explained showed no distinctive pattern, in addition, tides, gases, low frequencies and electromagnetic radiation was also looked into by this renowned seismologist. Even investigating the debate regarding coincident verses causation was applied she stated.

Applying Dr. Jones's analogy to one's own; if it rains in London for 15 days a month, then one were to predict that it would rain today, this would be deemed as inaccurate in Dr. Jones's assertions. [18]. However, if I were to say that it will rain in south London in the evening, this would be a more accurate prediction in meteorologic terms. Moreover, if this were applied to earthquake prediction, the accuracy would depend on time, location and more importantly its magnitude. Therefore, following her travels globally and ascertaining a new anomaly then assessing it, the results as Dr. Jones stated, had no real outcome within the result tabulations to this day. [18].

Previously in the 1980s, Hiroo Kanamori from his seismological laboratory at Caltech concluded in his paper The Nature of Seismic Patterns Before Large Earthquakes by stipulating that even with seismic patterns that were important to decipher the initialization of earthquakes and their process, however, for prediction, they have limitations due to their many variations. [19].

In conclusion, owing to Dr. Jones's remarks on this subject matter, it is clear to delineate that in the twenty-first century, not one top-tier seismologist can predict certain high magnitude earthquakes -anywhere. The science does not support the notion that any academic within this field could foresee a pending quake and its projected magnitude. Therefore, since the recent tragedies in both Türkiye and Syria on February 6, 2023, and over 7,500 aftershocks of varying magnitude, Turkish academics ought to resign themselves to working on solutions pre- and post-quake, rather than voicing further quake predictions which has been cited as beyond the current science. For example, the quake resistant buildings' enforcement measures and an early warning system, both on par with the Japanese and California models ought to be in their academic focus.

Literature review[6]

As part of this research certain books and other publications were noted in providing more detailed information to a layman on this scientific topic, namely:

1. Erdik, M. et al. (2015). Seismic hazard assessment of the East Anatolian Fault Zone in Turkey, *Journal of Seismology*, 2019, by M. Erdik et al. DOI: 10.1007/s11069-014-1541-
https://www.researchgate.net/publication/271726405_Earthquake_hazard_analysis_for_East_Anatolian_Fault_Zone_Turkey (Accessed 20 February 2015).

This article discusses the seismic hazard posed by the East Anatolian Fault Zone, which runs through southeastern Turkey. The authors use probabilistic seismic hazard analysis to estimate the likelihood and potential impact of earthquakes in the region.

2. Active Tectonics and Earthquake Potential of the Eastern Mediterranean Region, Geophysical Monograph Series, 2018, edited by I. Okay and S. Akyüz. DOI: 10.1002/9781119228366.

This book provides an overview of the tectonic processes and seismic activity in the eastern Mediterranean region, including southeastern Turkey. The chapters cover a range of topics, including fault systems, earthquake history, and seismic hazard assessment.

3. Şengör, AMC., Naci Görür, N., Şaroğlu, F. (1985). Authors Source: A. M. C. Şengör; Naci Görür ; Fuat Şaroğlu. https://doi.org/10.2110/pec.85.37.0211

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Geological Engineering. Haber Turk program of expert panelists. İstanbul depreme hazırlanabilir mi? | Teke Tek - 21 Şubat 2023. Vid: Time – 1:59:53. https://www.youtube.com/watch?v=ncUVrLLPvZ4. (Accessed 23 February 2023).

5. Şengör, AMC., Naci Görür, N., Şaroğlu, F. (1985). Authors Source: A. M. C. Şengör; Naci Görür ; Fuat Şaroğlu. https://doi.org/10.2110/pec.85.37.0211

NB: Many more publications contributed this research, that provided vital understanding of the subject matter at hand.

Discussion - Why Were the Turkish Authorities Lethargic in a National Emergency then a Tragedy? [6]

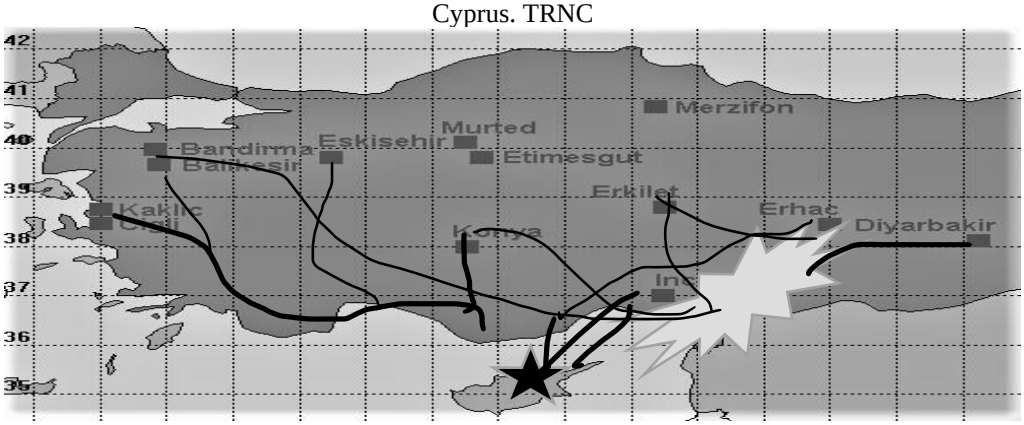
A Slow Government Response, where was the Turkish Military?

It was extremely noticeable as the international community viewed the various channels to see the devastating effect of the two huge earthquakes that hit southern Türkiye on the sixth day of a very bitter early morning that for the first 3 days there were no sign of any action plan for this region. Moreover, there was no sign of any Turkish Armed Forces' rapid reaction force. According to The National Defence Minister Hulusi Akar, rejected claims that the military reacted slowly. [38]. He also stated that commanders visited the affected areas, however, there was no mention of substantial troop numbers in the area. As there were no forces personnel *en masse* in the crumbled regions affected, it was clear, that there was no initial rapid deployment plan in place since a huge seismic event in 1999, in which President Recep Tayyip Erdoğan had promised during both his campaign then presidency. In recorded Turkish history, government administrations have fallen from power for much less. Additionally, this time, his own base of supporters have indeed criticized his lackluster performance. Owing to the data collated within this research, his term as a long-term serving leader of the Republic of Türkiye, is ending. Historically, the current CHP (Republic People's Party) opposition party, once lost power following the 1999 north-eastern quakes. Nevertheless, at this juncture, Erdoğan had also made more political errors citing the economy, inflation decisions and the lack of enforcing construction standards to property developers prior to this recent tragedy; only to be embarrassed further by international relief teams arriving to earthquake hit areas prior to the national rescue personnel. In fact, the only visible security entities within the national apparatus, were the Jandarma [Military Police] and the local civilian police; none of which were specialist rescue personnel. According to a report on February 7, 2023, The Second Corps of Türkiye, which has more than 100,000 troops, plus helicopters, planes, armored vehicles, and other vehicles like bulldozers, is in charge of the ten regions that were affected by the earthquake and are home to more than 15 million people. Thousands of members of the Turkish Naval and Air Force are also stationed in the area and could have been called to action. However, so far, the Turkish government had only stationed a small number of troops at Malatya airport.

The fact of matter is that this lethargic national response resulted in hundreds and thousands of its citizens being left exposed in the depths of winter without food, water, medical assistance and temporary toilet facilities for nearly a week and into the second week post-quake. Additionally, there are agricultural communities that still had not received assistance two weeks following the February 6 quakes. The affected comprised of women, children, new-born babies and the elderly. Moreover, a volunteer physician Dr. Naci Karahanci reported from Adıyaman stating that there were not even enough body bags for the dead 48 hours following the devastating day.

Figure 10. Possible Turkish Republic of Northern Cyprus Military Proximities and Range.

Figure 11. Current Military bases Active on the Mainland "Possible Urgent Assistance" with the Turkish Republic of Northern Cyprus. TRNC



Source: Global Security.org -Map of the Turkish Military Bases [12].

It is evident from one's map notations in *Fig.* 10 and 11 that there was ample opportunity for a rapid reaction force to be in place for emergencies of this nature. Demographically close location and with the apparatus the military has, why was the military ordered

for deployment to assist hundreds and thousands of destitute citizens? This question will remain until a valid explanation is published.

As for the statistics, according to the World Directory of Modern Military Aircraft, Türkiye's current military inventory accounts for 618: units:12.6% of which are Helicopters, essential for inaccessible post-quake areas. Secondly, 10.7% of said inventory are Transporter Aircraft, -which are essential for food, medical, clothing, tents and so on…[58]. Even though, these transporters eventually came into the service of the stranded citizens, once again, they were far too slow coming into being deployed. 4 days later is unacceptable, in most countries.

As for the geographic data of nearby Turkish forces, one wonders relating to the troops based in the Turkish Republic of Northern Cyprus TRNC-KKTC. Currently there are approximately 40,000 servicemembers stationed north of the island. They could have been easily deployed as part of an established operational force in an emergency of this seismic nature. Alas, there obviously no known plan in place, this is the only conclusion where a lack of government efficiency led to action of lethargy, whereby there are more questions than actual answers for their own citizens of whom suffering in this terribly cold isolated dust filled predicament.

According to *Macrotrends* an analytical company researching militaries of the world, The Republic of Türkiye has the fifth largest army in the world with some 512,000 servicemen and women at its disposal. [28]. Yet once more: where were these troops when they were needed?

Conclusion and Discussion[7]

This exhaustive study into a tragic event has exposed that the Turkish government has indeed had a part to play within both the lethargic rescue and aid missions for their population, as many international contingents arrived at the affected locations prior to actual Turkish forces. Two huge earthquakes nine-hours apart resulting in a combined energy release of x 1,500 (1945) Hiroshima bombs, was indeed a terrifying, calamitous seismic event. For many days survivors remained stranded, only being left to their own devices for many days, including experiencing the many aftershocks in subzero conditions.

Turkish President Recep Tayyip Erdoğan's reign that has lasted for over two decades. We must recall that his coming to power was following the 1999 Kocaeli quakes. Erdoğan promised within his election campaign the same year, that Türkiye would be better prepared under his leadership: Building regulations, economy, and earthquake preparedness. Following this research and its many observations, the results have shown that the Turkish administration has failed its people and the promise it had made to them. Unfortunately for this president, all these indiscretions and maladministration have been witnessed by the international community. The eleven findings in this conclusion will assist the reader in elucidating this study's results.

i) This paper has approached every aspect of this Turkish catastrophe, being historically, ethically, morally arithmetically and scientifically. All the results have exposed the inadequacies of the current Turkish government or regime.

ii) Post the two earthquakes, it is illustrated and confirmed that the government was very slow to respond for many days. Quake survivors were left to their own devices to try to extricate their family member and friends. Sifting through the toxic dusty rubble in subzero temperatures without warm clothing, shelter, food, and clean water. The military shockingly, were absent for many days even though there were ample bases nearby as exemplified in *figures 10,11*. Thus, there was no excuse for their absence in affected regions, as this nation is the fifth largest in military personnel numbers globally. The only conclusion is that there was neither a rapid response force nor an action plan full stop involving state, provinces and the military, since the 1999 Kocaeli earthquakes.

iii) Turkey has had its fair share of seismic activity Table 1. The affected region was overdue for a large series of quakes as *fig. 3* indicated. However, low grade infrastructure – building regulations remained.

iv) A detailed comparison between Japan and Türkiye was made; structurally, magnitude logarithmically and testing to see which nation could withstand the hardest earthquakes. It was shown that the 2011 9.1 Japan Great Quake would have had more buildings standing if it was not for the resulting tsunami.

v) This research also cross-referenced the building regulations strictly enforced in Japan compared to the Republic of Türkiye. Once more, the results revealed that there was nepotism, flagrant ignorance of inhabited life and illegal building clearances with monumental, scaled corruption within the Turkish construction industry. The data presented in this study, showed that the evidence supports the aforementioned with corroborated sources. Conclusion; a clear case of governmental gross negligence.

vi) Further arithmetic calculations compare five large quakes per nation. Japan had the severest quakes over 25+ years compared to Türkiye, moreover, lost significantly less lives overall, including buildings. An energy difference between a 9.0 to 8.0 combined quake of Türkiye, is 32 times more powerful, and Japan generally has far less fatalities and less fallen apartment buildings. In fact, Türkiye has had 45% more deaths than Japan throughout the standard error and logarithmic calculations. [Table 6].

vii) A detailed Japanese building regimen was discussed and circumstantiated, and it was discovered that Japan has strictly enforced building regulations with severe penalties. Their buildings are referenced in three categories Earthquake resistant, Damping and Seismic Isolation, however, Turkiye has nothing resembling these in its construction mandate. *Figure 8.* [20].

viii) Early warning systems between Turkiye and Japan are again showing differences. Japan has new underwater technology beneath the pacific to detect P waves to warn the public, transportation, and companies alike, giving vital seconds to exit buildings and shut down the metro networks. Additionally, ceasing construction workers from operations. Istanbul has the main modern scientific system for early warning, these sensors are only stationed on land. There is no real EW system near the current south-eastern disaster areas. If they had, it should have worked. The Istanbul ER system provides 4/5 seconds warning, in Japan, from 6 to 30 seconds. Depending on where the citizens are located; the distances near and far from a quake's epicentre; the farther away they are the more seconds gained to take effective action.

ix) With many thanks to Dr. Lucy Jones' contribution, this paper has dispelled the myth of earthquake predictions from certain Turkish seismology experts. Thanks to Dr. Jones's valuable statements on this subject matter, this paper can empirically record that there is no science to support the notion that Earthquakes could be predicted to its correct magnitude at the moment.

x) Referring to Turkish President Recep Tayyip Erdoğan's war on academe, can only be a negative for any nation. Since an alleged coup attempt in 2015, he changed out all senior academic managers in both the ministries and its universities. This has only led to fear in the workplace thus, a lack of trust within the system. The only result of this government intimidation is that the professors of whom are related to seismology, will not be taken seriously, especially when specialist papers are submitted. These could be blocked by the government appointed Dean of School or a given faculty. Freedom of thought and discussion is the norm for Higher Educational existence, not oppression.

xi) As for the Psychosocial effects on those survivors of this calamity, this paper has attempted to verse suggestions from active clinicians who have experienced earthquake related trauma. PTSD has been cited as the most concerning result of such an episode referenced in this paper. The affects are relative to the children, adolescents, and the parents/guardians. The whole family spectrum was affected by this disaster. Currently, the local psychologists in the region are engaging with the earthquake children in drawing therapies inclusive of English classes which is an attempt to re-establishes a child's routine. As a child's routine is a sense of being occupied, whereby teachers are donating their time by travelling to these infants and children alike, in an effort to try and stabilize their traumatic experiences with some make-shift school-curricula classes, however, within trying circumstances. Finally, the Istanbul population are worried about the integrity of their own domiciles, so much so, many are fleeing the city.

In summarization, this research was conducted in a very short timeframe due to the very importance and nature of the subject matter, and the many lives that were tragically lost. Therefore, the following are the recommendations from the resulting data findings themselves.

Firstly, the Turkish government will hold a general election proposed for the summer of 2023. In light of constant issues plaguing this administration, from mismanaging its extremely high inflation of a year-on-year figure of now at staggering CPI 55.18%, (at the time of this paper's drafting) the loss of the Turkish Lira against the U.S. Dollar value of some 44% in 2021 alone, including the continued implementation of a presidential decreed Earthquake Tax or Special Communications Tax following 1999 quakes, has not gone down well with the populous. The former was long before this recent quake and subject of note in this research. It is clear from the data that there was no action plan as discussed, this was evidenced from the woeful reaction to the homeless in many cities following the life-taking quakes on February 6, 2023, hence the focus of this paper. For an election campaign, it would be insensitive to elucidate politics whilst this crisis is ongoing in many fluid ways, but only to say that this situation throughout the annals of history is not survivable for this particular Erdoğan administration.

Secondly, any new in-coming administration must implement the following recommendations a) controlled demolition of all unsafe building that remain throughout the country. b) A building decree as of Japan's model, and severe penalties to those involved in a suspect building's planning permission process. All academics within the seismological field, produce reports on building parameters with signatories to their governors and the state. Said new administration must acknowledge such reports as priority. c) There must not be a divide between provinces and the state, the rule of law must be universal with clarity open to the public. d) All buildings must face regular inspection by the supervising engineers and one specialist earthquake engineer through every phase of said construction project. e) Financial houses of whom have facilitated loans must receive regular reports on said building's progress within the new states construction guidelines. f) Photographic evidence must be retained for all future buyers of said property upon showing interest; with topography testing and soil composition suitable for said construction project. g) Property lawyers be involved within the purchasing process, to support buyers throughout the said process, from the banking instruments to the building's documentation inclusive of engineering and surveyor reports for all phases to conception. h) All bank loans (mortgages) be only paid once the building has been completed, and all safety documents from each specialist are in place including regular yearly building maintenance records. This will be confirmed by an engineer appointed by said bank and agreed by the purchasers' real estate lawyer. This will be concluded by a letter of sale from the state. i) Finally, life, housing insurance must be provided by the bank or develops alike upon exchange of contracts for purchase.

Only these aforementioned provisions will protect Turkish citizens within their own homes. In addition, all bureaucracy will be on the same page with no way out if tragedy strikes once more. This paper also ought seek advice from overseas experts to ensure that all the technical requirements are being met. As millions of souls have been lost during Türkiye's long history of active seismic activity. The days of deliberate avoidance in regulations due to increasing steel costs are over. Politicians will be under scrutiny following the election cycle following such a terrible event. As described and detailed in the findings, money verses citizens' lives used to be a medieval bronze aged process. A footnote: Türkiye has never had 9.0 recorded magnitude earthquake, and as we still cannot predict next one and its magnitude. It is recommended that all structures be resistant to withstand a 9.0, as no expert will ever know for decades when this could occur. Case-in-point, there has been a mini exodus of Istanbul while this paper was being drafted, the psychological affects have indeed spread northwest due to the building safety uncertainty. So, a new government has much to do to appease its shell-shocked citizens from all over the mainland.

An appropriate statement annotated from a university colleague Prof. B. Galindev a literature professor, he noted of this tragedy, that history is teaching us that nations, especially big countries, should abandon their political ideological, national, ideological enmities, and human beings should direct their economic and spiritual resources to combat sudden natural hazards, destruction, and loss of ecological balance. [10].

The former should be noted by the squabbling politicians who are only engaged in campaign rhetoric. Please remember, whomever is successful in the next election process, that the population is traumatized, having inadequate living standards since both Covid-19, inflation malpractice and February 6 harsh events. Stay away from academe, it is the future of any nation and possesses a country's grey matter. Unless, the rule of law and an authentic phase of government prevail, Türkiye has little hope of being a respected nation of modernity.

"*I have no religion, and at times I wish all religions at the bottom of the sea. He is a weak ruler who needs religion to uphold his government; it is as if he would catch his people in a trap".*

Mustafa Kemal Atatürk (Founder of the Republic of Türkiye)
1881- 1938

Finally, a message to Türkiye - *Bir gün ülkenize döneceğim ve geleceğinizin profesyonellerini yetiştirmeye devam etmek için üniversitelerinizden birinde günlerimi sonlandıracağım. geçmiş olsun ve başsağlığı dilerim – Türkiye.*

One commends this study for your attention... (Miller, A.D. 2023).

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