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The economic dimension of earthquakes: A general overview related to the February 6th Kahramanmaras earthquake

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ABSTRACT
This study examines the economic implications of the February 6th Kahramanmaraş earthquake, emphasizing its impact beyond physical destruction to broader economic and societal dimensions. The research employs fieldwork and survey methods to assess the earthquake's effects on the local economy. The collected data undergo statistical analysis to quantify the economic impact, offering valuable insights for disaster management and future preparedness strategies. The findings contribute to policy discussions on mitigating the economic consequences of earthquakes and enhancing resilience against natural disasters.
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1. INTRODUCTION

Earthquakes are among the most destructive natural hazards, often causing massive damage and far-reaching socioeconomic impacts. Turkey faces a persistent and significant risk of earthquakes due to its geographical location in a seismically active zone. This vulnerability poses a major challenge to the country's economic and social stability, and the February 6 Kahramanmaraş earthquake has once again drawn attention to the need to assess earthquakes not only from a geological or humanitarian perspective, but also from the perspective of their economic consequences.

This study explores the economic impact of the February 6 Kahramanmaraş earthquake, focusing on both immediate and long-term financial impacts. In addition to physical damage, earthquakes affect local and national economies through direct costs, infrastructure damage, job losses, and sectoral economic recession.

2. DEFINITION OF EARTHQUAKE

Earthquakes are natural geophysical events caused by sudden movements within the Earth's crust, resulting in the release of accumulated energy in the form of seismic waves. These movements occur primarily along fault lines, where tectonic stresses build up over time until they are suddenly released. This release of energy produces ground shaking that can range from mild tremors to catastrophic events that cause widespread damage (Altun, 2018).

Seismologists measure earthquakes using standardized scales such as the Richter magnitude and moment magnitude (Mw), which quantify the amount of energy released during an earthquake. However, the amount of damage caused by an earthquake is not determined solely by its magnitude.Other critical factors include the depth of the seismic event, its proximity to densely populated areas, the quality of local infrastructure, and adherence to building codes.

For countries situated in high-seismic-risk zones like Turkey, understanding the fundamental characteristics of earthquakes is essential beyond mere scientific interest. A comprehensive grasp of seismic activity is crucial for urban planners, engineers, policymakers, and emergency response teams. Effective earthquake preparedness and mitigation strategies rely not only on geological research but also on integrating this knowledge into national economic and infrastructural planning (Stein, 1999).

3. HISTORY OF EARTHQUAKES

Earthquakes have been recorded throughout human history, shaping civilizations and influencing societal structures. The earliest documented earthquake dates back to 1831 BCE in China, where historical records describe significant destruction and loss of life. Ancient civilizations, including those of Greece, Rome, and Egypt, meticulously documented seismic activities, recognizing their potential to devastate cities and disrupt economies (Stein & Wysession, 2003).

Throughout history, several major earthquakes have had profound social, economic, and geopolitical consequences:

- **AD 365 – Greece and Egypt:** A massive earthquake struck the Eastern Mediterranean, causing widespread destruction in Alexandria, Libya, Cyprus, and surrounding regions. With an estimated magnitude exceeding 8.0, it triggered a tsunami that devastated coastal areas.
- **1556 – Shaanxi, China:** This earthquake remains the deadliest in recorded history, claiming approximately 830,000 lives. With an estimated magnitude between 8.0 and 8.3, its devastation was exacerbated by vulnerable housing structures and high population density.
- **1755 – Lisbon, Portugal:** One of the most catastrophic earthquakes in European history, this event had an estimated magnitude of 9.0 and caused widespread destruction in Portugal, Morocco, and even parts of southern England. The disaster significantly influenced European philosophical thought, particularly in the works of Voltaire.
- **1906 – San Francisco, USA:** Striking at 5:12 AM local time, this earthquake, with an estimated magnitude of 7.9, caused massive fires and infrastructure collapse, leading to extensive economic losses.
- **1976 – Tangshan, China:** One of the most devastating earthquakes of the 20th century, it had a magnitude of approximately 7.5 and resulted in an estimated 242,000 deaths, although some sources suggest even higher figures.

The study of historical earthquakes provides valuable insights into earthquake patterns, risk reduction strategies, and economic recovery mechanisms. By analyzing past events, policymakers and researchers can improve urban planning, increase infrastructure resilience, and develop more effective disaster preparedness plans (Stein, 1999).

4. EARTHQUAKES IN TURKEY

Turkey is one of the most seismically active countries in the world due to its location at the intersection of the Eurasian, Arabian, and African plates. This geographical location puts the country at high risk of earthquakes, especially along major fault lines such as the North Anatolian Fault Zone (NAFZ), the East Anatolian Fault Zone (EAFZ), and the Greek Arc. Throughout history, these fault lines have triggered many devastating earthquakes that have severely affected Turkey's economy, infrastructure, and social fabric.

4.1 Significant Earthquakes in Turkey

The 1939 Erzincan Earthquake

With a Richter scale value of 7.8, the Erzincan Earthquake, which occurred on December 26, 1939, was one of the most devastating earthquakes in Turkey's history. Tens of thousands were injured and left homeless as a result of the incident, which claimed the lives of about 33,000 people. The Turkish government introduced the first national earthquake laws and tightened construction codes as a result of this earthquake.

The Marmara Earthquake of 1999

One of the most destructive natural disasters to hit Turkey in recent memory is the 1999 Marmara Earthquake. With a magnitude of 7.6, the earthquake struck at 03:02 AM on August 17, 1999, causing extensive damage in Istanbul, İzmit, Yalova, Bursa, and Sakarya. Hundreds of thousands of people were displaced, and more than 17,000 people died. The economic loss was estimated at $20 billion, highlighting the vulnerability of Turkey’s urban infrastructure. This event led to significant legal and institutional reforms, including the establishment of the Disaster and Emergency Management Authority (AFAD) and the introduction of compulsory earthquake insurance.

The 2011 Van Earthquake

On October 23, 2011, a 7.1-magnitude earthquake struck Van Province in eastern Turkey. The tremor severely affected Van’s central district and Erciş, resulting in 604 fatalities and over 4,000 injuries. The disaster exposed weaknesses in emergency response coordination and reinforced the need for improved earthquake-resistant building strategies.

4.2 Economic and Social Consequences of Earthquakes in Turkey

Due to its high seismic activity, earthquakes in Turkey have far-reaching economic and social consequences. Large-scale seismic events disrupt economic growth, damage infrastructure, and lead to substantial financial burdens on the public and private sectors (Eğilmez, 2023).

- **Infrastructure and Investment:** Earthquakes severely impact energy grids, transportation networks, schools, hospitals, and industrial facilities, with reconstruction costs reaching billions of dollars.
- **Productivity Losses:** Disruptions in agriculture, manufacturing, and services sectors contribute to GDP contraction and increased unemployment.
- **Insurance and Financial Stability:** Earthquakes cause fluctuations in financial markets, leading to increased insurance premiums and affecting Turkey's credit ratings.
- **Foreign Investment:** High earthquake risk may deter international investors, slowing down economic development.
- **Education and Healthcare:** Damage to educational institutions affects long-term human capital development, while healthcare system disruptions can result in secondary health crises, including epidemics.
- **Social Inequality and Security:** Vulnerable populations, particularly those in low-income housing, are disproportionately affected, exacerbating social inequalities and increasing displacement.
- **Cultural Heritage:** Destruction of historical sites and cultural landmarks results in the irreversible loss of national identity and heritage.
- **Public Awareness and Governance:** Earthquakes test the efficiency of government crisis management while providing opportunities to strengthen disaster preparedness policies and public awareness campaigns.

Turkey's seismic history underscores the critical need for continuous investment in earthquake-resistant infrastructure, public awareness initiatives, and advanced disaster management strategies. While significant progress has been made in the past two decades, ongoing efforts are required to mitigate the economic and social consequences of future earthquakes (Altun, 2023).

5. Application Aimed at Determining the Effects of the February 6th Earthquake

Given Turkey's high seismic activity, effective disaster management and mitigation strategies require robust empirical research. This study aims to assess the economic impact of the February 6th, 2023, Kahramanmaraş earthquake, which affected 11 provinces: Kahramanmaraş, Hatay, Gaziantep, Adana, Kilis, Osmaniye, Malatya, Elazığ, Şanlıurfa, Diyarbakır, and Adıyaman. The research employs a field-based methodology, incorporating survey data and statistical analysis to quantify the earthquake's effects on local economies. The findings contribute to a deeper understanding of economic vulnerabilities and inform policy recommendations for future disaster preparedness.

5.1 Methodology

A field research was carried out in the impacted areas to examine the economic effects of the earthquake. Using survey methodology, the study gathered primary data from municipal officials, company owners, and people.

- Data Collection Method: To acquire both qualitative and quantitative information on housing problems, job disruptions, and economic losses, a standardized questionnaire was created.
- Sampling Framework: By aiming for 1,000 respondents, the poll guaranteed a representative sample drawn from a range of socioeconomic backgrounds.
- Survey Implementation: In order to maximize response accuracy and collect firsthand descriptions of economic issues following the earthquake, in-person interviews were conducted.

This scientific approach guarantees a thorough and data-driven assessment of the economic effects of the earthquake.

5.2 Literature Review

Prior research on the financial effects of natural catastrophes provide important background for the results of this study. The macroeconomic impacts of earthquakes have been examined in a number of important works:

- **Ahlerup (2013)** utilized **EM-DAT disaster data for 157 countries** to assess the relationship between natural disasters and economic growth.
- **Benson (1997)** examined the economic consequences of disasters in **Fiji, the Philippines, and Vietnam,** highlighting sectoral vulnerabilities.
- **Felbermayr & Gröschl (2014)** investigated the negative growth effects of natural disasters, emphasizing long-term economic distortions.
- **Şen (2023)** analyzed the macroeconomic implications of the Kahramanmaraş earthquake, suggesting that it will likely lead to a downturn in economic indicators.
- **Shelor, Anderson, & Cross (1992)** studied the impact of earthquakes on **insurance markets**, revealing significant financial instability following major seismic events.
- **Yamori & Kobayashi (1999)** examined the effect of earthquakes on financial markets, concluding that large-scale disasters disrupt market stability and investor confidence.
- **Eğilmez (2023)** argued that earthquake-related expenditures contribute to inflationary pressures in the economy.

These studies serve as a foundation for understanding the long-term economic implications of earthquakes and reinforce the necessity of proactive disaster preparedness measures.

5.3 Data Collection Instruments

The study employed a structured questionnaire to collect data during field investigations in the earthquake-affected regions. A 15-question survey was developed to examine key economic indicators, including:

- **Housing damage and reconstruction costs**
- **Employment and income disruptions**
- **Business closures and financial losses**
- **Government and NGO aid effectiveness**
- **Availability of basic services (water, power, and medical care)**

A Likert Scale was used to improve response reliability by giving participants a graded way to convey their financial difficulties.

5.4 Data Analysis

Following data collection, statistical software was used to code and evaluate replies in a methodical manner. The following were important analytical methods:

- **Frequency and percentage distribution:** Used to decipher respondents' economic and demographic traits.
- **Comparative statistical analysis:** Looked at differences in economic impact between various occupational and income categories.
- **Regression analysis:** was used to evaluate the relationship between earthquake damage and the duration of financial recovery.

The findings give policymakers and disaster response organizations vital information on the economic impact of the February 6th earthquake in a measurable manner.

6. DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Determining the economic impact of the Kahramanmaraş earthquake on February 6th requires an understanding of the demographics of survey respondents. This section gives a thorough picture of the impacted population by displaying the respondents' distribution by age, gender, income levels, and educational background.

6.1 Gender Distribution

One thousand individuals from the earthquake-affected areas made up the study sample. According to the gender breakdown, 35% of respondents were women and 65% of respondents were men (Table 1, Figure 1). This demographic makeup reflects the general labor trends in the region, where there are typically more men working in industries, services, and construction.

Table 1. Gender of Participants

Gender	Frequency	Percentage
Male	650	65
Female	350	35
Total	1000	100

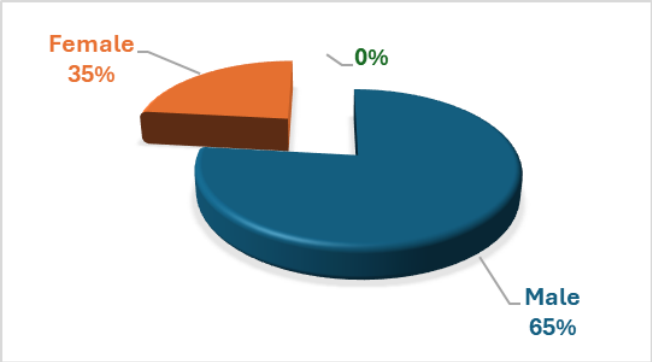

Figure 1. Gender Distribution of Participants

6.2 Age Distribution

The participants' age distribution sheds light on the earthquake's social and economic effects on various age groups. The survey included a wide range of ages, with the bulk of participants (34.3%) being between the ages of 45 and 55. This suggests that middle-aged people, many of whom are employed, were particularly impacted.

Table 2. Distribution of Participants by Age Group

Age Range	Frequency	Percentage
56 and above	177	17.7
the age range of 50-55	195	19.5
the age range of 45-49	148	14.8
the age range of 40-44	96	9.6
the age range of 35-39	102	10.2
the age range of 30-34	77	7.7
the age range of 25-29	89	8.9
the age range of 19-24	69	6.9
unanswered	47	4.7
total	1000	100

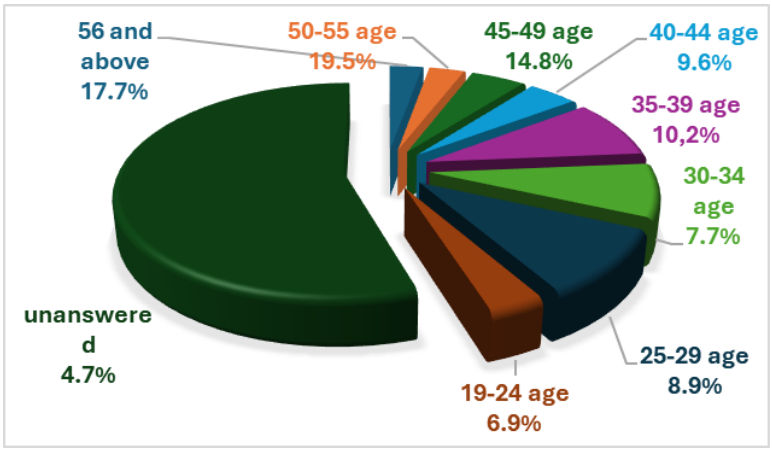

Figure 2. Age Distribution of Participants

6.3 Educational Background of Participants

Economic resilience and post-disaster recovery are significantly influenced by educational attainment. According to the survey's findings, most respondents (32.5%) had only completed elementary school, with middle school graduates (24.8%) coming in second. These numbers demonstrate how vulnerable low-education groups are since they are more likely to work in low-paying, unorganized sector jobs that are disproportionately impacted by economic downturns.

Table 3. Educational Status of Participants

Educational Status	Frequency	Percentage
elementary school	325	32.5
middle school	248	24.8
high school	186	18.6
vocational high school	127	12.7
undergraduate degrees	69	6.9
postgraduate degrees	21	2.1
unanswered	24	2.4
total	1000	100

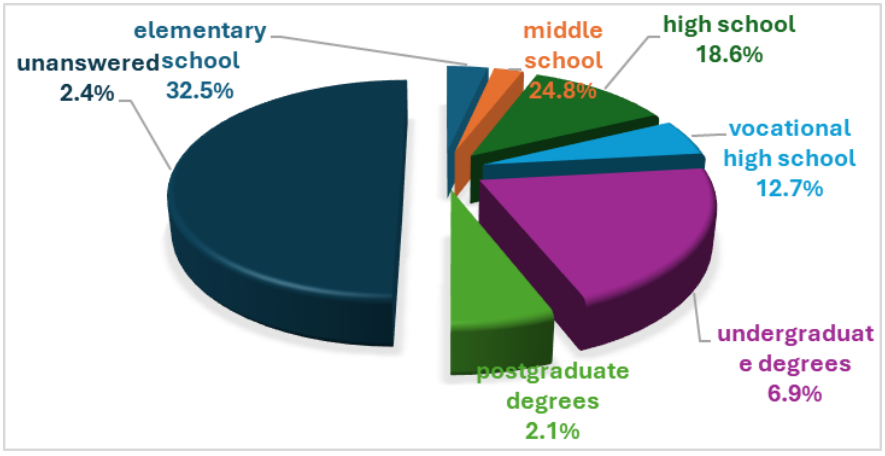

Figure 3. Educational Background of Participants

6.4 Income Levels of Participants

Income distribution provides insight into the financial burden placed on households due to earthquake-related damages. The majority of respondents (31.25%) reported a monthly income between 15,000–20,000 TL, while 24% reported earnings between 20,000–25,000 TL. Lower-income households were disproportionately affected, struggling with reconstruction costs and reduced employment opportunities.

Table 4. Income Status of Participants

INCOME LEVEL	Frequency	Percentage
10000 TL	302	1.5
10000--15000 TL	446	2
15000--20000 TL	97	24.25
20000--25000 TL	84	31.25
25000--30000 TL	61	24
30000 TL and above	13	22.5
unanswered	5	1.25
total	1000	100

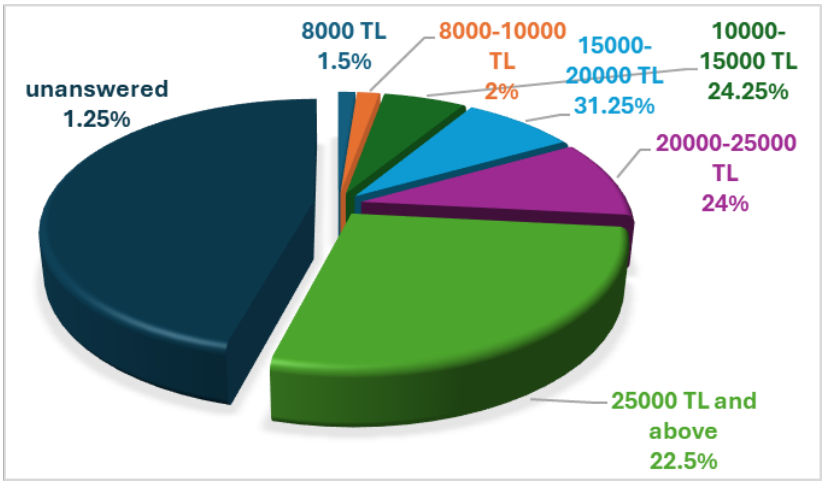

Figure 4. Distribution of Participants' Income Levels

7. CURRENT LIVING CONDITIONS OF PARTICIPANTS

Assessing the post-earthquake living conditions of affected individuals provides crucial insights into the socio-economic challenges faced during the recovery process. This section examines housing ownership, adequacy of support received, extent of property damage, and infrastructure conditions, highlighting key vulnerabilities and resilience factors within the earthquake-affected regions.

7.1 Housing Ownership Status

Homeownership plays a significant role in determining economic resilience following natural disasters. The survey findings indicate that 63% of participants were homeowners, while 35% lived in rented accommodations. The remaining 2% did not specify their housing status (Table 5, Figure 5).

Homeowners faced substantial financial burdens related to property repairs and reconstruction costs, whereas renters often experienced displacement due to uninhabitable housing conditions. These findings emphasize the need for targeted financial assistance programs for both homeowners and renters to facilitate long-term recovery.

Table 5. Housing Ownership Status

Housing Status	Frequency	Percentage
Yes	630	63
No, I Live In A Rented House	350	35
Unanswered	20	2
Total	1000	100

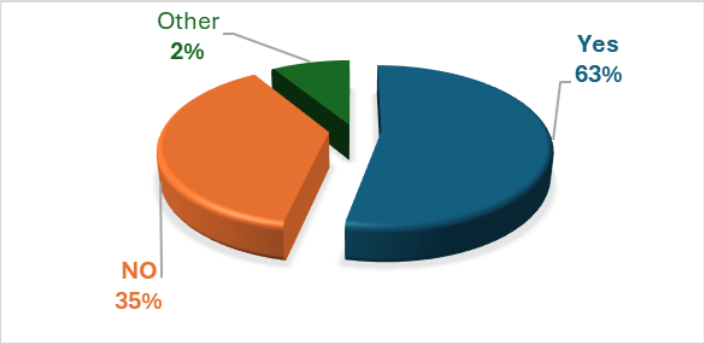

Figure 5. Housing Ownership Status

7.2 Adequacy of Support Received

The effectiveness of post-disaster relief efforts significantly influences recovery trajectories. Survey results reveal that 70.4% of participants felt they received adequate support, while 29.6% reported insufficient aid (Table 6, Figure 6).

The variation in aid distribution may be attributed to differences in socio-economic status, geographic location, and the effectiveness of emergency response mechanisms. These findings highlight the importance of equitable and well-coordinated disaster relief strategies to ensure that all affected individuals receive adequate support.

Table 6. Adequacy of Support Received

support Perception	Frequency	Percentage
Received Adequate Support	704	70.4
Did Not Receive Adequate Support	296	29.6
Total	1000	100

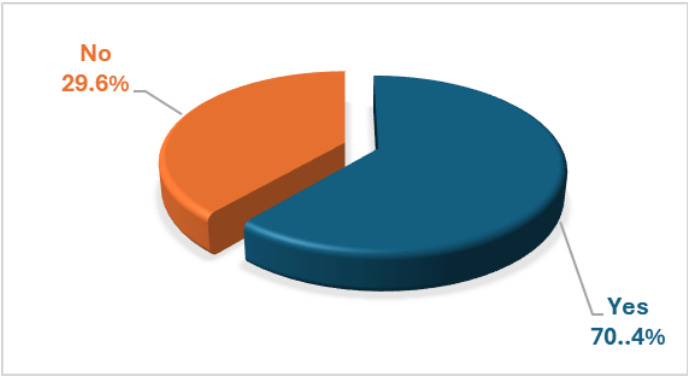

Figure 6. Adequacy of Support Received

7.3 Housing Damage and Structural Conditions

The degree of structural damage to homes is a critical factor in assessing economic loss and recovery needs. The study found that 52.3% of participants reported severe housing damage or complete collapse, while 22.5% required repairs. Only 25.2% of respondents reported that their homes remained intact (Table 7, Figure 7).

Severe housing damage correlates with higher reconstruction costs, prolonged displacement, and increased financial strain on affected households. These findings reinforce the necessity of stronger building codes, urban resilience planning, and financial relief programs to support long-term recovery.

Table 7. Housing Damage and Structural Conditions

Housing Condition	Frequency	Percentage
Severe Damage or Collapsed	523	52.3
Requires Repairs	225	22.5
Undamaged	252	25.2
Total	1000	100

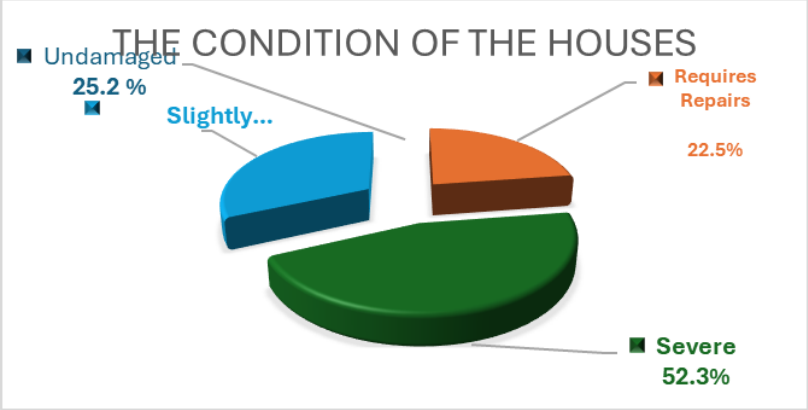

Figure 7. Housing Damage and Structural Conditions

7.4 Electrical and Heating System Repairs

Infrastructure resilience is a crucial determinant of post-disaster recovery. The survey results indicate that:

- 28.3% of participants reported needing repairs in their electrical systems (Table 8, Figure 8).
- 32.1% required repairs to their heating systems (Table 9, Figure 9).

These figures suggest that energy infrastructure vulnerabilities significantly affected daily life and economic productivity in the aftermath of the earthquake. Strengthening energy resilience through improved urban planning and emergency power supply measures is essential for future disaster preparedness.

Table 8. Electrical System Repair Needs

Electrical System Condition	Frequency	Percentage
In Need Of Repair	283	28.3
Normal	146	14.6
Good	571	57.1
Total	1000	100

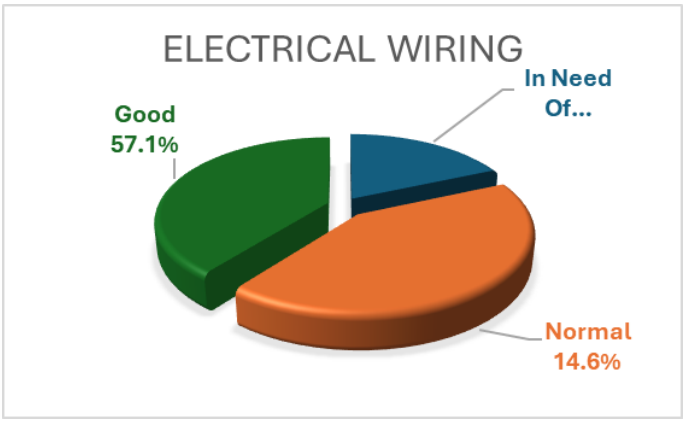

Figure 8. Electrical System Repair Needs

Table 9. Heating System Repair Needs

The Condition Of Your Heating System	Frequency	Percentage
In Need Of Repair	321	32.1
Normal	179	17.9
Good	500	50.0
Total	1000	100

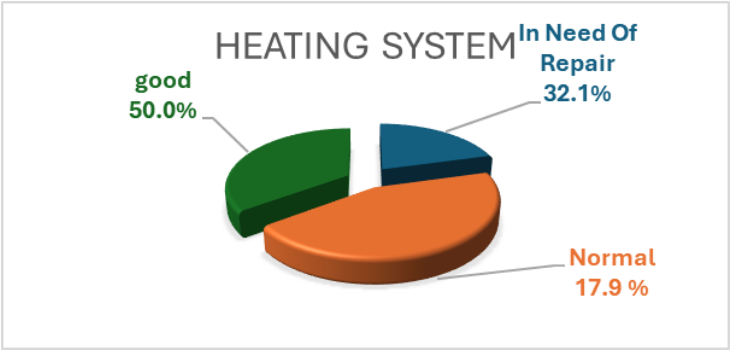

Figure 9. Heating System Repair Needs

7.5 Participants' Water Plumbing Systems' Repair Needs Status

In the field research conducted in the earthquake-affected area, when looking at the repair needs of the participants' water systems, it was observed that 31.1% of them needed repairs. The remaining 69% of the participants indicated that the condition of their hot water systems was normal (46%) or good (22.9%) (Table 10, Figure 10).

Table 10: Repair Needs of Participants' Water Systems

Water System Condition	Frequency	Percentage
In Need Of Repair	311	31.1
Normal	460	46.0
Good	229	22.9
Total	1000	100

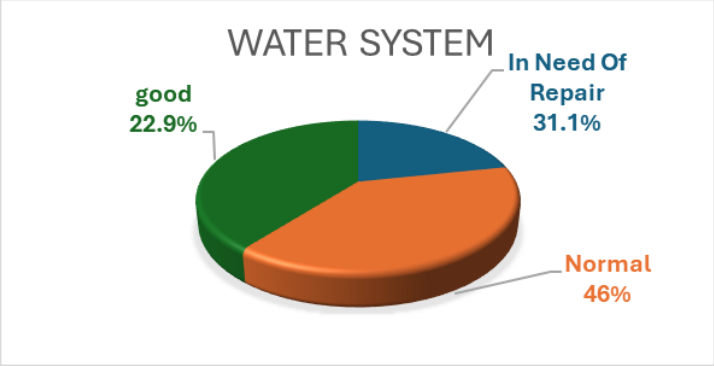

Figure 10. Distribution of Participants' Water System Repair Needs

7.6 Ages of the Buildings Where the Participants Reside

In the field study conducted in the earthquake-affected area, it was found that 38.9% of the buildings where the participants reside are older than 20 years, while the remaining 61.1% are less than 20 years old. This information could be significant, especially in the context of an earthquake, as the age of a building can be a factor in its structural integrity and resilience to seismic activity (Table 11, Figure 11).

Table 11: Age of the Buildings Where Participants Reside

Construction Year of the Building	Frequency	Percentage
After 2000	611	61.1
Before 2000	389	38.9
total	1000	100

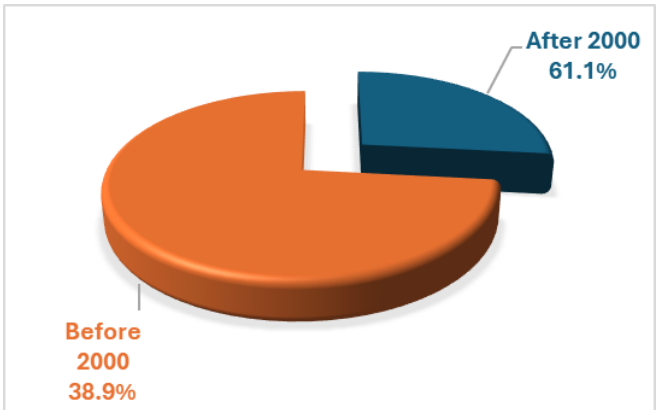

Figure 11. Distribution of the Ages of the Buildings in Which the Participants Live

7.7 Improvements Made in Buildings with Minor Damage

In the field research conducted in the earthquake-affected area, when looking at the distribution of participants' answers regarding improvements made in their buildings, it was found that:

- 10.9% made improvements to the elevators in their buildings,
- 12.4% to the existing solar energy systems,
- 32.5% to the insulation systems,
- 9.8% to the heating systems, and
- 34.4% made improvements in other areas within the building (Table 12, Figure 12).

Table 12. Improvements Made in Buildings with Minor Damage

Improvements Made in Buildings with Minor Damage	Frequency	Percentage
Elevator	109	10.9
Solar Energy	124	12.4
Insulation	325	32.5
Heating System	98	9.8
Other	344	34.4
TOTAL	1000	100

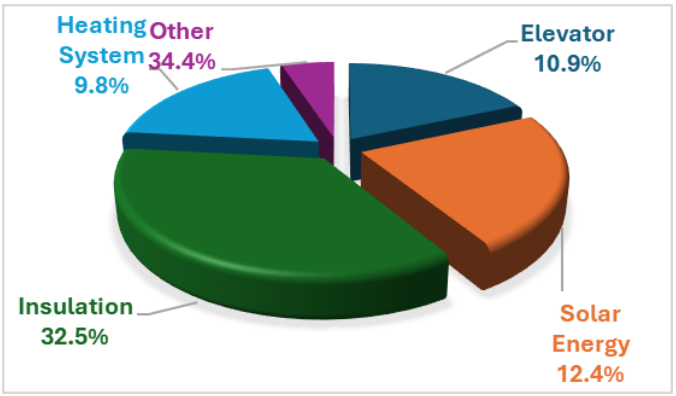

Figure 12. Distribution of Improvements Made in Buildings with Minor Damage

7.8 Participants' Satisfaction with Support from Civil Aid Organizations

In the field research conducted in the earthquake-affected area, 78.4% of the participants indicated that they received adequate support from civil aid organizations, while 21.6% felt that they did not receive adequate support (Table 13, Figure 13).

Table 13. Participants' Perception of Adequate Support from Civil Aid Organizations

Adequate Support Received from Civil Aid Organizations	Frequency	Percentage
Yes	784	78.4
No	216	21.6
Total	1000	100

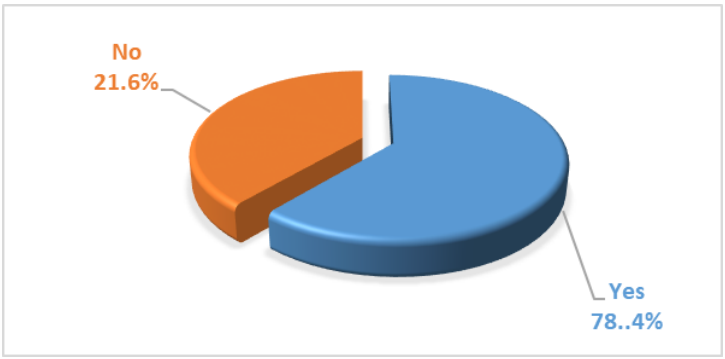

Figure 13. Participants' Satisfaction with Support from Civil Aid Organizations

7.9 Did Sufficient Aid Come from Countries Around the World?

In the field study conducted in the earthquake-affected area, it was observed that 67.8% of the participants felt that they did not receive sufficient aid from countries around the world, while 32.2% felt that they did receive adequate assistance. This data suggests that there may be room for improvement in international aid efforts for disaster-affected communities (Table 14, Figure 14).

Table 14. Whether sufficient aid has come from countries around the world or not

Whether sufficient aid has come from countries around the world or not	Frequency	Percentage
Received Adequate Aid	322	32.2
Did Not Receive Adequate Aid	678	67.8
Total	1000	100

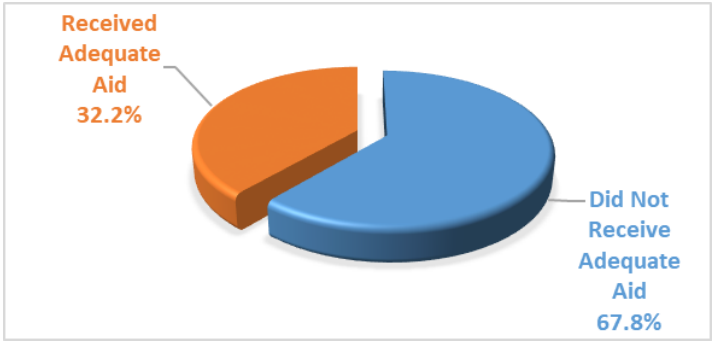

Figure 14. Participants' opinions on whether sufficient aid has come from countries around the world or not

7.10 Did Participants Expect an Earthquake to Occur in This Region?

In a field study conducted in an earthquake-prone area, it was found that 70.5% of the participants do not expect another earthquake in the region, while 29.5% do expect another seismic event. This data provides important insights into how well the community is prepared for potential future earthquakes, both psychologically and in terms of disaster preparedness measures (Table 15, Figure 15).

Table 15. Whether participants expected or did not expect an earthquake in this region

Whether participants expected or did not expect an earthquake in this region	Frequency	Percentage
Not Expecting Another Earthquake	705	70.5
Expecting Another Earthquake	295	29.5
total	1000	100

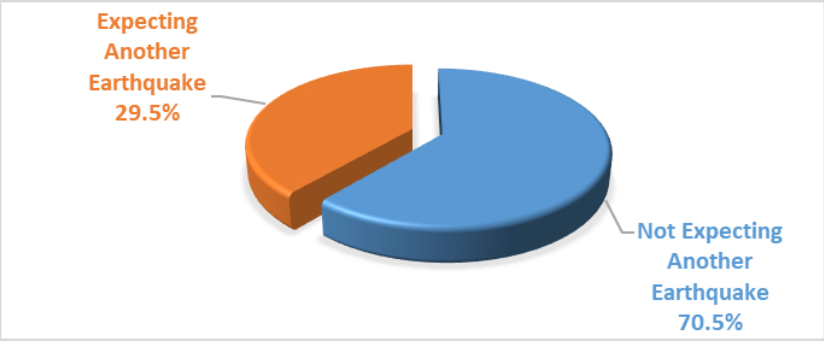

Figure 15. Whether participants expected or did not expect an earthquake in this region

8. Conclusion and Recommendations

The February 6th earthquake had severe economic, social, and infrastructural consequences, affecting thousands of individuals and businesses. The results of this study indicate significant challenges related to housing conditions, financial stability, infrastructure repair, and access to essential services in the earthquake-affected regions. Addressing these challenges requires a multi-faceted approach involving government agencies, non-governmental organizations (NGOs), and international aid efforts.

8.1 Key Findings

1. Housing and Infrastructure Damage

- 52.3% of surveyed households reported severe housing damage or total collapse.
- 31.1% of participants required urgent water system repairs, while 32.1% reported heating system damage.

2. Economic Impact

- Many households experienced job losses and financial instability due to the earthquake's disruption of local economies.
- Lower-income families faced significant financial burdens, with many struggling to cover housing repairs and daily expenses.

3. Effectiveness of Aid and Relief Efforts

- 70.4% of respondents felt they received adequate support, while 29.6% stated the aid was insufficient.
- 67.8% of participants believed international aid efforts were inadequate, indicating the need for improved global disaster response strategies.

4. Disaster Preparedness and Community Resilience

- 70.5% of participants did not expect another earthquake in their region, highlighting a gap in public awareness and preparedness.
- Buildings constructed before 2000 were more likely to suffer severe damage, reinforcing the need for updated seismic safety regulations.

8.2 Policy Recommendations

Based on the findings, the following recommendations are proposed to enhance disaster resilience and economic recovery:

1. Strengthening Building Codes and Urban Planning

- Enforce stricter building regulations to ensure structures are earthquake-resistant.
- Implement mandatory retrofitting programs for high-risk buildings.
- Develop sustainable urban planning strategies that reduce population density in seismic zones.

2. Improving Disaster Preparedness and Emergency Response

- Increase public awareness programs on earthquake risks and preparedness.
- Establish community-based disaster management initiatives to strengthen local resilience.
- Enhance coordination between government agencies, NGOs, and international aid organizations for faster response times.

3. Economic Support for Affected Households and Businesses

- Provide low-interest reconstruction loans and direct financial aid to affected families.
- Introduce tax relief measures for businesses impacted by the earthquake.
- Establish employment recovery programs to support individuals who lost their jobs due to the disaster.

4. Strengthening International Aid and Cooperation

- Improve international coordination mechanisms to ensure faster and more efficient aid distribution.
- Develop a global disaster relief fund to support rapid recovery efforts in high-risk regions.
- Encourage public-private partnerships to finance long-term infrastructure rebuilding projects.

8.3 Future Research Directions

Additional investigation is required to:
Examine long-term patterns of economic recovery in areas damaged by earthquakes.
Assess the success of relief initiatives and post-disaster policies.
Examine the latest developments in earthquake-resistant infrastructure technology and how they are being applied in high-risk locations.
Governments and humanitarian groups can increase resilience and lessen the long-term consequences of earthquakes on communities by implementing a comprehensive strategy that include policy changes, financial assistance programs, and improved disaster preparedness.

Resources

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