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**6 FEBRUARY 2023**  
**EARTHQUAKES DETECTION**  
**AND EVALUATION REPORT**

**23 FEBRUARY 2023**

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## INTRODUCTION

On 6 February 2023, according to Kandilli Observatory and Earthquake Research Institute data

<sup>1</sup> An earthquake with a magnitude of 7.7 occurred in Sofalaca-Şehitkamil-Gaziantep at 04.17 local time. On the same date, another earthquake with a magnitude of 7.6 occurred at 13.24, centred in Ekinözü-Kahramanmaraş. The earthquakes were shallow focussed at a depth of approximately 5 km and were felt in a wide area covering Southeastern Anatolia, Eastern Anatolia, Central Anatolia and Mediterranean Regions.



Kandilli Observatory - Location map of Sofalaca-Şehitkamil -Gaziantep (Mw=7.7) earthquake



Kandilli Observatory - Location map of Ekinözü-Kahramanmaraş (Mw=7.6) earthquake

<sup>1</sup> B.Ü. Kandilli Observatory and EIA Regional Earthquake-Tsunami Monitoring and Assessment Centre 06 February 2023 Sofalaca Şehitkâmil Gaziantep Earthquake Press Release, 06 February 2023 Ekinözü Kahramanmaraş Earthquake Press Release

According to the data of Kandilli Observatory and Earthquake Research Institute on 20 February 2023 when the report was prepared <sup>2</sup> A magnitude 6.4 earthquake occurred at 20.04 local time in Büyükçat-Samandağ-Hatay. The earthquake, which was shallow focused at a depth of approximately 8 km, was felt in the Mediterranean, Eastern and Southeastern Anatolia regions.



Kandilli Observatory - Location map of Büyükçat-Samandağ-Hatay (Ml=6.4) earthquake

According to the data of Republic of Turkey Ministry of Interior Disaster and Emergency Management Presidency; the centre of the first earthquake was Pazarcık-Kahramanmaraş and the centre of the second earthquake was Elbistan-Kahramanmaraş. The centre of the earthquake in Hatay was announced as Defne District.

On 18 March 2018, the Earthquake Hazard Map of Turkey published in the official gazette <sup>3</sup> In the region covering the provinces of Kahramanmaraş, Malatya, Adıyaman and Hatay, a large part of which is defined as high-hazard, two of the largest earthquakes occurred in our country, and the consequences were quite devastating.

<sup>2</sup>B.Ü. Kandilli Observatory and EIA Regional Earthquake-Tsunami Monitoring and Assessment Centre 20 February 2023 Büyükçat-Samandağ-Hatay Earthquake Press Release  
<sup>3</sup>AFAD Turkey Earthquake Hazard Map

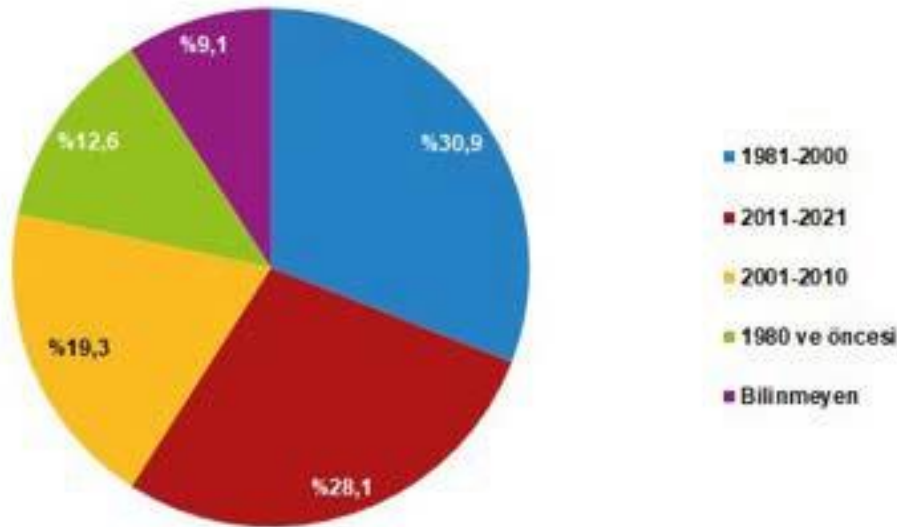


<sup>4</sup>Turkish Statistical Institute Address Based Population Registration System Results-2022

IL	2022 TOTAL POPULATION	2022 PROVINCE AND DISTRICT POPULATION CENTRES	2022 TOWNS AND VILLAGES POPULATION
Adana	2 274 106	2 274 106	-
Adiyaman	635 169	458 278	176 891
Diyarbakir	1 804 880	1 804 880	-
Elazig	591 497	459 901	131 596
Gaziantep	2 154 051	2 154 051	-
Hatay	1 686 043	1 686 043	-
Malatya	812 580	812 580	-
Kahramanmaras	1 177 436	1 177 436	-
Sanliurfa	2 170 110	2 170 110	-
Kilis	147 919	116 361	31 558
Osmaniye	559 405	439 537	119 868

Turkish Statistical Institute - 2022 Address Based Population Registration System Results

According to Turkish Statistical Institute data published on 27 December 2022 <sup>5</sup> According to the data, 30.9 per cent of the buildings where citizens reside in Turkey were constructed between 1981-2000, 28.1 per cent between 2011-2021, 19.3 per cent between 2001-2010 and 12.6 per cent between 1980 and before.



<sup>5</sup> Turkish Statistical Institute Building and Housing Qualifications



Turkish Statistical Institute - Proportion of households by year of construction of the building of residence, 2021

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<sup>5</sup>Turkish Statistical Institute Building and Housing Qualifications

Number and proportion of households by year of construction of the building of residence, 2021		
Building construction year	Number of households residing in the dwelling	Ratio
Total-Total	25 329 833	100,0
1918 and before 1918 and before	69 711	0,3
1919-1945	147 897	0,6
1946-1960	370 906	1,5
1961-1970	767 714	3,0
1971-1980	1 823 578	7,2
1981-1990	3 082 990	12,2
1991-2000	4 751 598	18,8
2001-2005	2 192 513	8,7
2006-2010	2 693 706	10,6
2011-2015	3 765 336	14,9
2016 and onwards 2016 and after	3 355 799	13,2
Unknown-Unknown	2 308 085	9,1

Turkish Statistical Institute - Number and proportion of households by year of construction of the building of residence, 2021

Turkish Statistical Institute data <sup>6</sup> According to the data, out of a total of 3,478,575 buildings in Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa, 51.14 per cent were built in 2001 and after, 27.56 per cent between 1981 and 2000 and 9.96 per cent in 1980 and before. The date of construction of 11.33 per cent of the buildings is unknown.

<sup>6</sup> Turkish Statistical Institute Building and Housing Qualifications

Province	Number of households residing in the dwelling	Building construction year				Year of building construction (%)				
		1980 and before	1981-2000	2001 and after	Unknown	Total	1980 and before	1981-2000	2001 and after	Unknown
Adana	632 875	82 344	220 496	244 668	85 367	100,0	13,0	34,8	38,7	13,5
Adiyaman	155 300	13 547	36 586	81 271	23 896	100,0	8,7	23,6	52,3	15,4
Diyarbakir	394 867	25 818	104 960	229 532	34 558	100,0	6,5	26,6	58,1	8,8
Elazig	173 836	17 396	41 103	91 777	23 560	100,0	10,0	23,6	52,8	13,6
Gaziantep	522 947	34 351	135 511	269 876	83 209	100,0	6,6	25,9	51,6	15,9
Hatay	449 151	60 710	146 509	224 464	17 468	100,0	13,5	32,6	50,0	3,9
Malatya	230 499	32 239	64 869	111 603	21 787	100,0	14,0	28,1	48,4	9,5
Kahramanmaraş	311 458	36 479	83 717	181 016	10 247	100,0	11,7	26,9	58,1	3,3
Sanliurfa	411 421	22 769	76 306	251 163	61 183	100,0	5,5	18,5	61,0	14,9
Kilis	40 020	4 464	8 680	20 917	5 959	100,0	11,2	21,7	52,3	14,9
Osmaniye	156 199	16 465	40 070	72 686	26 979	100,0	10,5	25,7	46,5	17,3

Turkish Statistical Institute -Number and proportion of households by province and year of construction of residential building, 2021

When the official data are analysed, it is understood that a large part of the building stock in the provinces affected by the earthquake was not built before 1999 as claimed; the ratio of new buildings built in 2001 and after is approximately fifty percent in the collapsed or damaged buildings.

Between 11-16 February 2023, a delegation consisting of members of the Central Board of Directors of the Chamber of Architects, members of the Board of Directors of the Ankara and Istanbul Metropolitan Branches, experts and Chamber employees who are members of the Committee for the Protection and Development of Cultural Heritage, as well as the Chairmen of the Board of Directors of the Branches and Representative Offices of the Chamber of Architects and experts working in relevant institutions, visited Adana, Osmaniye, Hatay-Antakya and Samandağ, Gaziantep-İslahiye and Nurdağı, Kahramanmaraş-Pazarcık, Adiyaman, Malatya, Kahramanmaraş, Hatay-Payas and İskenderun and carried out assessments and determinations in the city centres. As a result of the investigations and assessments carried out in the region, it was observed that Hatay, Kahramanmaraş, Adiyaman and Malatya suffered the most damage and the effects of the

earthquake were more intense among the provinces of Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa.

## **EMERGENCY RESPONSE PROCESSES AFTER EARTHQUAKE**

In all of the affected residential areas in the region after the earthquakes;

- search and rescue
- nutrition, housing and health services
- damage assessment
- debris removal

It is known that there is a delay in the works. It has been observed that the emergency response after the disaster and the recovery processes to be carried out afterwards could not be realised at an adequate level due to the lack of coordination and planning among the institutions in charge and the losses have increased.

Coordinator Governors were appointed by the Ministry of Interior in the provinces affected by the earthquake. However, it was observed that these assignments caused confusion of authority, duty and responsibility in post-disaster activities.

In addition to the Disaster and Emergency Management Presidency (AFAD), national and international non-governmental organisations, professional chambers, international aid organisations and volunteer teams took part in the region, but it was informed that volunteer teams and international organisations ended their work in the area early due to coordination and security problems.

After the earthquake, it was learnt that there were disruptions in shelter, nutrition, cleaning and health services in all provinces affected by the disaster. It was observed that the need for shelter could not be met as emergency and temporary shelter settlements could not be established or were insufficient.

As of 16 February 2023, it was observed that the need for tents, food and hygiene materials continued; the aid sent to meet these needs was directed to be distributed by AFAD, but the aid could not be delivered to the areas in need due to lack of organisation.

### **Emergency and Temporary Accommodation Settlements**

It has been observed that tents and temporary shelter units in the region are not organised in an orderly and planned manner, but are scattered in marketplaces, parks or city squares.

Public institutions which had institutional experience and accumulation in disaster preparedness and management of post-disaster processes in the past and which took part in the process during and before the 1999 Marmara Earthquakes, such as the General Directorate of Civil Defence, General Directorate of Disaster Affairs and General Directorate of Emergency Management of Turkey, were closed down and their authorities and responsibilities were transferred to the Disaster and Emergency Management Presidency (AFAD) in 2009. The duties and authorities of the organisations such as Turkish Red Crescent Society and Search and Rescue Association (AKUT), which would take part in disasters, were restricted and their duties were defined to support AFAD in the Disaster Response Plan of Turkey.

Although the Red Crescent System Building Factory in the Shelter Systems Production Base established by the Turkish Red Crescent Society in Malatya, which is defined as the world's largest disaster shelter unit production centre, is the largest prefabricated building and container production factory in the country, it was revealed that sufficient tents and prefabricated units were not produced and stocked to meet the post-earthquake shelter needs.

The Turkish Red Crescent Society, which is expected to take part in meeting the need for emergency and temporary shelter after an earthquake, is recognised in the Turkish Disaster Response Plan.<sup>7</sup> In disasters and emergencies, only the Disaster Nutrition Group has been designated as responsible for the Disaster Nutrition Group, and a supportive role has been defined in other areas.

Due to the ongoing earthquake conditions in the region, moderate and severe damages to urban and rural building stock, and climatic conditions, there is an urgent need for temporary shelters with common canteens, health centres, mobile toilets and bathrooms.

#### **Debris Removal and Damage Assessment Works**

It has been observed that the debris removal works in all the cities and rural settlements affected by the earthquake, especially in Hatay, Kahramanmaraş, Adıyaman and Malatya, which suffered the most destruction and heavy damage, have been carried out in an unsupervised manner without adequate equipment and necessary machinery.

The works for the removal of the ruins and debris of the demolished or heavily damaged buildings in the region; construction waste without taking the necessary precautions such as irrigation and waste separation,

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<sup>7</sup> AFAD Turkey Menstrual Intervention Plan (TAMP)

It was observed that debris and rubble removal works were carried out. In addition to hazardous chemicals, harmful compounds such as asbestos and dust were observed to be released into the air; it is also known that the debris and wreckage of damaged or demolished buildings were discharged into nearby protected areas and industrial zones without taking the necessary precautions.

Teams formed by the Ministry of Environment, Urbanisation and Climate Change started to work in the region for damage assessment. However, there are reservations that these teams cannot be formed in a healthy manner within the scope of professional expertise and experience with the aim of completing the damage assessments of a large number of buildings quickly and in a short time.

It is understood that there are problems in the independent, technically and scientifically based decision-making processes of the teams carrying out damage assessment studies by classifying the buildings as undamaged, slightly damaged, moderately damaged, heavily damaged, urgently demolished and collapsed based on observational examination.

It is foreseen that there may be a need to update the identification studies depending on the ongoing seismicity conditions, aftershocks and new earthquakes in the region.

In order to accurately determine the damages and responsibility ratios in buildings, care should be taken to ensure that the expert committees, which take part in the execution of judicial and legal processes related to buildings that collapsed or were severely damaged and where loss of life and property occurred, are formed by professionals who are impartial and experienced in their fields of expertise, and work should be carried out with sensitivity.

### **Permanent Housing Production and TOKİ**

The President of the Republic and the Ministry of Environment, Urbanisation and Climate Change have announced that permanent housing in the region will be completed within 1 year; 200 thousand houses will be built by TOKİ in urban areas and 70 thousand houses will be built in rural areas as a process of reconstruction and reconstruction of the earthquake zone. It is stated that new settlements will be determined and the sociological, demographic and cultural structure will be preserved by taking into account the disaster risks



and soil characteristics of the process. It is stated that 30 thousand houses are projected in the first stage; the houses will be designed as 105 square metres 3+1 and will not exceed ground + 3-4 floors.

Furthermore, it is not explained on the basis of which data the planning, site selection, number of houses and infrastructure works for the houses to be produced by TOKİ are based.

Although it was announced that approximately 200 thousand houses would be built within 1 year, according to Ministry data, only 21 thousand 140 of the 24 thousand 963 houses planned to be built in Elazığ after the 2020 Elazığ earthquake could be completed within 3 years. Similarly, of the 5 thousand 61 houses planned to be built by TOKİ for citizens whose houses were destroyed and severely damaged in the 2020 Izmir earthquake, only 2 thousand 245 could be completed by the end of 2022.

In the 20-year period between 2003 and 2022, 1 million 170 thousand houses were constructed by TOKİ. Accordingly, TOKİ can produce 58,500 houses annually.

PROVINCES	NUMBER OF EXISTING TOKI HOUSING	TOKI PERMANENT AFTER THE EARTHQUAKE NUMBER OF DWELLINGS	HOUSING TO BE BUILT WITHIN THE SCOPE OF TOKI 250 THOUSAND SOCIAL HOUSING PROJECT NUMBER
Adana	21154	2500	6356
Adiyaman	7065	25882	1750
Diyarbakir	20912	6000	4800
Elazig		3750	1651
Gaziantep	27947	18544	10024
Hatay	8018	40426	4450
Kahramanmaras	5545	45067	3101
Kilis	1929	250	500
Malatya	20605	44770	2251
Osmaniye	3323	9550	1550
Sanliurfa	17261	3000	6000
<b>Total</b>	<b>133759</b>	<b>199739</b>	<b>42433</b>

TOKİ - Number of existing, permanent and social housing units planned to be constructed in the Earthquake Zone

It should not be forgotten that the process to be carried out by reusing the building production and inspection process, planning and construction methods that have been carried out to date, which have caused destruction and losses, will cause new losses and destruction.

Considering the aftershocks and possible new earthquakes, it is obligatory not to start construction activities in the earthquake-affected area and to determine the necessary periods for the commencement of building and construction activities by monitoring the developments.

### **Adana**

Since the scale of the destruction and damage in the city was small compared to other cities, it was observed that search and rescue, sheltering and feeding, debris removal activities carried out by the relevant municipalities and institutions were organised at an adequate level and in place.

In Adana, as of 11 February 2023, damage assessment works on buildings were also started; architect colleagues and civil engineers affiliated to our branch took part in the works.

### **Osmaniye**

As of 11 February 2023, debris removal works are being carried out in the city.

It has been observed that damage assessment works have not yet been carried out and completed at an adequate level.

### **Hatay**

It was reported that the central administration and AFAD took an active role in search and rescue operations on the fourth day of the earthquake. As of 12 February 2023, it was observed that some parts of the city had not yet been worked on, and work was still needed for construction equipment or rescue teams to reach most points.

It was reported that search and rescue and response teams arrived late in rural areas. It is not possible to obtain reliable information about the aid sent to the region, rescue operations and

the extent of structural damage. It was observed that citizens affected by the earthquake met their vital needs such as shelter and nutrition through their relatives and relatives in the region.

It was observed that search and rescue operations were carried out by miners, volunteer organisations and AFAD, as well as volunteer teams from international organisations.

In Hatay, it was observed that tents and AFAD coordination points were not set up in an organised and planned manner, but were scattered in marketplaces, parks or city squares. It was observed that vital needs such as nutrition and hygiene could not be adequately met in these areas.

It was interviewed that there were security problems in the city, more intensely in certain areas, and that security forces kept watch, but it was not sufficient. It was observed that the materials inside the buildings, most of which were heavily damaged, were evacuated and the cash registers of some banks were removed.

It is learned that non-governmental organisations and volunteer teams participating in search and rescue operations in Antakya and Samandağ gradually withdrew from the field due to security problems.

Aid materials sent to the city are distributed with the coordination of voluntary organisations and professional chambers.

The old town municipality building of Defne District is used as TMMOB Coordination Centre. Trucks carrying aid materials from Provincial Coordination Committees are unloaded and sorted at this centre and then delivered to those in need.



Hatay - Defne District TMMOB Disaster Coordination Centre

Unlike the systems in the past, the aids are prepared in packages according to the lists received from those in need and then delivered to those concerned.

#### **Hatay - Payas**

AFAD did not carry out search and rescue activities due to the lack of teams in the district and the magnitude of the destruction in the area.

As of 16 February 2023, search and rescue, recovery of the missing and debris removal activities in the district are carried out by the Municipality and the District Governorate.

#### **Hatay-İskenderun**

As of 16 February 2023, search and rescue and search and rescue operations are continuing in İskenderun district.

It was reported that search and rescue operations in İskenderun, as in the city centre of Antakya, could not be actively carried out in the first three days of the earthquake.



Iskenderun - General Directorate of Highways former construction site / Disaster and Emergency Assembly Area

TMMOB Coordination Centre has been established in Iskenderun and works have started for the distribution of incoming aid. The problem of shelter and nutrition continues in the district and tents and food aid are needed.

Damage assessment works have started in the city.

### **Gaziantep**

As of 13 February 2023, there are no search and rescue activities in the ruins of the city, but search and rescue activities continue.

Organised industrial zones, OIZs, administrative buildings, cafeterias, warehouses and offices of OIZs, which are spread over a large area in Gaziantep, are used to meet the need for emergency and temporary shelter.

Damage assessment works have started in the region and architect colleagues and civil engineers who are experienced in the field of application have been selected and trained by the Provincial Directorate of Environment, Urbanisation and Climate Change and then assigned to the field.

### Gaziantep - Islahiye and Nurdagi

As of 13 February 2023, search and rescue operations are ongoing in Islahiye and Nurdagi districts of Gaziantep.



Islahiye - Bus Terminal tent compound



Islahiye - Bus Terminal tent compound



It was observed that a tent settlement was established in front of the bus terminal in Islahiye. However, it was observed that fire, epidemics and security problems may occur due to the irregular and close proximity of the tents.

Governors of Amasya, Mardin and Diyarbakır have been appointed as coordinating governors in Nurdağı District, but this situation causes confusion of administrative authority and lack of coordination.

It was observed that there were problems in the distribution of the aid reaching the district to those in need. It was observed that tent settlements were not established and the tents distributed to earthquake victims were scattered at different points.

### **Adiyaman**

It was learnt that no search and rescue operations were carried out in the city for two days after the earthquake.

As of 14 February 2023, it was observed that search and rescue operations were carried out at some points and debris removal operations were carried out at some points.

In the city where a planned tent settlement was not established, it was observed that the earthquake victims set up the tents they could reach near the collapsed or heavily damaged buildings.

### **Malatya**

Although AFAD was on the ground in the city from the first day of the earthquake, it could not carry out sufficient work due to lack of coordination and organisation, and its teams were insufficient. Construction equipment and operators brought to the city with the initiatives of professional chambers and volunteers could not work for four days because the necessary assignments could not be made, and then they left the region due to the nutrition and shelter problems that arose.

As of 14 February 2023, hundreds of ruins and debris in Malatya city centre have not yet been worked on. However, due to climatic and earthquake conditions, earthquake victims with

relatives under the rubble had to leave the region.

It was reported that damage assessment works started on the fourth day of the earthquake, and that the building stock

According to the studies completed in 20 per cent, more than 3 thousand heavily damaged buildings were identified.

As of 14 February 2023, it was observed that the aid delivered to the city decreased and the need for tents and food continued.

It was learnt that there are security problems and conflicts in Malatya for various reasons; it was reported that there are problems of extortion, looting and theft.

Coordinator Governors were appointed in the city, but it was observed that these appointments could not solve the problem of administrative authority and coordination in post-disaster operations.

As of 22 February 2023, it was informed that the debris removal works had not yet started in the city.

### **Kahramanmaras**

While search and rescue operations were carried out in some areas of the city and efforts were made to remove the missing people, it was observed that debris removal operations were carried out in some areas.

As of 15 February 2023, there were no coordination points or tent camps established in Kahramanmaraş city centre to meet emergency shelter and other needs.

### **Kahramanmaras - Elbistan**

In the light of the information received from the region, it was learnt that search and rescue operations were inadequate after the earthquake.

It was reported that while the citizens affected by the earthquake in the district tried to rescue the victims with their own efforts immediately after the earthquake, as of 14 February 2023, there were still no trained search and rescue teams working and many ruins were still uninhabited.

There are problems with shelter, nutrition and heating. As of 14 February, TMMOB and affiliated professional chambers are distributing the aid materials delivered to the district. The tent settlements are located far from the city centre and in insufficient number.

### **Diyarbakir**

A total of 7 buildings were demolished in Diyarbakır city centre, 3 of which were illegal buildings. 409 people lost their lives in the city.

In Diyarbakır, with the support and efforts of professional chambers and the TMMOB Coordination Board, search and rescue was organised and vital needs such as shelter and nutrition were met.

For emergency and temporary shelter, undamaged public buildings and railway wagons were used. Tent settlements were established in certain areas in the city.

Professional chambers contributed to the damage assessment studies carried out by the Ministry, and at the time of the preparation of the report, 45149 buildings were identified as of 20 February 2023. 1110 buildings were identified as urgently demolished, 1044 buildings were identified as moderately damaged, 10977 buildings were identified as slightly damaged and 32018 buildings were identified as undamaged.

## **PLANNING DECISIONS, STRUCTURAL DAMAGES AND LOSSES IN URBAN AREAS**

According to the observations and evaluations on the damaged and demolished buildings in the city centres, it is understood that the following practices and decisions are effective on the causes of structural damages and demolitions.

- Development plans and plan amendments made without taking disaster data into consideration,
- Encouraging illegal construction through zoning amnesty, projects and applications contrary to zoning rules, illegal constructions
- Opening agricultural lands and soils with low bearing capacity for construction,
- Exclusion of qualified architecture, engineering and planning services from the building production and inspection process,
- Insufficiency of technical staff and lack of supervision in vocational specialities,
- Failure to establish the structure-ground relationship, construction on grounds that are not suitable for the load of the structure,
- Disruption of the soil-structure relationship by increasing the building load with high-rise buildings,
- Soil liquefaction,
- Damages caused by not selecting a suitable foundation,
- Architectural and structural system designs that do not take seismic loads into account,
- Faulty material selection, workmanship and applications,
- Low concrete quality,
- Use of flat reinforcement and insufficient number of reinforcement,
- Use of hollow and beamless floors without taking the necessary precautions,
- Damage caused by interventions made during use,
- Modifications made due to commercial functions (market, gallery, office, etc. functions) on the ground-floor of the buildings, wide openings, mezzanine floors and different floor heights, resulting in soft floor and short column effect,
- The occurrence of a hammering effect due to the lack of the necessary arrangements in the adjacent building layout,

## Adana

In Adana, as of 11 February 2023, 11 buildings collapsed, 408 people lost their lives and approximately 7 thousand people were injured. 9 of the damaged buildings were destroyed in the first earthquake and 2 of them were destroyed in the second earthquake. It has been informed that these buildings consist of 16-17 storey reinforced concrete buildings and the areas where the buildings are located have been recently built up. The buildings affected and damaged by the earthquake were constructed after 2000, while the demolished buildings were constructed after 1990. Adana in the period they were built

While it was a 3rd degree earthquake zone, it was later defined as a 2nd degree earthquake zone.

Güzelyalı, Huzurevleri and Yurt neighbourhoods in the north of the city were most affected by the earthquake. While destruction and damage occurred in Çukurova District, no destruction occurred in Seyhan District. While there were vineyards and vineyard houses in the affected areas before the construction, the region is the highest part of the city. There is ground slippage in this area close to the lake. In the area where lime quarries are located, the ground shows clay soil characteristics.



Adana - Aplarlan Turkes Boulevard



Adana - City centre demolished buildings

### **Osmaniye**

In Osmaniye, as of 11 February 2023, 326 buildings collapsed, 877 people lost their lives and 2220 people were injured.

In the city, which developed on the east-west axis, the damage caused by the earthquake was observed in the north of this axis. Many buildings on Hasan Çenet Street, known as İstasyon Street, where the railway station is located, have collapsed. There are many damaged buildings on Musa Şahin Boulevard, which is connected to this street, and soil liquefaction is known to be high in the region.

Metin Tamer Housing Estate consisting of 12 blocks built in the 1990s in the city was heavily damaged and some blocks were demolished.





Osmaniye - Metin Tamer Site after earthquake

## **Hatay**

Although the number of collapsed buildings in Belen and Defne districts of Hatay was low, it was observed that all buildings were at least moderately or severely damaged.

In Defne district and Antakya, it was observed that low-rise buildings and small industrial estates that did not receive qualified architectural engineering services were severely damaged or collapsed. However, extensive damage was also observed in buildings constructed after the recent updates of the Turkish Building Earthquake Code in 2007 and 2018. In most of the buildings, it was observed that residential and commercial functions were used together and the soft floor effect was intense on the floors where commercial activities were carried out.



Hatay - heavily damaged and demolished buildings in the city centre



Hatay - heavily damaged and demolished buildings in the city centre

In the city centre of Antakya, public buildings, religious buildings, civil buildings and residences are destroyed or damaged. As of 12 February 2023, streets and avenues are lined

with destroyed buildings.

The old city centre has been closed due to the debris. There are areas and neighbourhoods in the old city centre that cannot be entered due to narrow streets and topography.



Damage to Hatay Cultural Centre after the earthquakes of 6 February 2023



Damage to Hatay Cultural Centre after the earthquakes of 6 February 2023



Damage to Hatay Cultural Centre after the earthquake of 20 February 2023

Continuing seismicity conditions in the region, aftershocks and the earthquake on 20 February 2023 Following the 6.4 magnitude earthquake; it is understood that there is a need to update damage assessment studies in Hatay city centre and rural areas.



Damage to Hatay city centre after the earthquakes of 6 February 2023



Damage to Hatay city centre after the earthquakes of 6 February 2023

### **Hatay-Payas**

In the district centre, buildings whose ground floors are used for commercial activities have suffered heavy damage and destruction due to collapses in these parts. It was reported that columns were cut and structural changes were made in the interventions made for commercial functions. As of 16 February 2023, 85 people lost their lives in the district.

### **Hatay-Iskenderun**

Many buildings on the coast and in the centre of the city were destroyed and heavily damaged, and many lives were lost. However, as of 16 February 2023, it is unclear how many buildings collapsed and how many lives were lost.

In Iskenderun city centre, liquefaction, subsidence and heaving were observed on Cengiz Topel Street and Atatürk Boulevard on the coastline. It was observed that the buildings on the boulevard collapsed to the ground by 1 metre. On the second day of the earthquake, the sea level rose and the buildings and roads on the coast were under water.



Iskenderun Cengiz Topel Caddesi

On Cengiz Topel Avenue, the construction limited to 2 storeys in the past was later allowed up to 4 storeys. While the buildings built in accordance with these regulations on the coastal band were not demolished in the earthquake, the buildings with illegal storeys in violation of the zoning rules were demolished.

The 8-storey Eda Apartment Building on the beach was demolished as a result of the construction of 4 more floors above the 4 floors permitted by the zoning rules. In the other two demolished buildings on the beach, it was reported that there were 4 illegal storeys over 4 storeys.



Iskenderun - Eda Apartment





Iskenderun - Multi-storey buildings demolished on the coastal belt

In the area known as Adana Road in the city, multi-storey buildings built in 1980 and afterwards were demolished. Many buildings at the junction known as Pac Square were demolished or heavily damaged.

The former Highways Construction Site area in the city is currently used as a Disaster and Emergency Assembly Area, but in the past, this area was prevented from being opened for construction by changing the zoning plans as a result of the struggle of the Chamber of Architects Hatay Branch.

### **Gaziantep**

A total of 28 buildings collapsed in Gaziantep city centre as of 13 February 2023. 27 of them collapsed in the first earthquake and 1 collapsed in the second earthquake.

There is no damage concentrated in a neighbourhood or region throughout the city of Gaziantep. The year of construction of the destroyed or damaged buildings also varies. The number of people who lost their lives in the city centre is over 400 as of 13 February 2023. Three of the collapsed buildings are high-rise buildings.

Since the cladding material is widely used in the buildings in the city centre, the damage situation in the buildings cannot be seen exactly. However, it is predicted that almost every building has light or moderate damage.

In the 6-block Ayşe-Mehmet Polat Complex located on Naci Topçuoğlu Boulevard, 4 blocks collapsed completely. It was observed that the buildings with adjoining building layout had different floor heights on the ground and ground floors, and the reinforcement and concrete quality were low.



Gaziantep - Ayşe-Mehmet Polat Sitesi

In Gaziantep, it was observed that illegal housing estates and colleges were built in the 100th Year Atatürk Park and its surroundings, which should have been a green area along the stream and a Disaster and Emergency Gathering Area.

Chamber of Architects Gaziantep Branch filed a lawsuit against the Gaziantep Metropolitan Municipality and related administrations against the master plan amendments brought within the scope of the 100th Year Atatürk Park Project, the attempts to make a commercial centre, the zoning plan amendment made under the name of two fuel stations and cultural centre, hotel bazaar, restaurant, the zoning plan amendment made with the definition of LPG station, the zoning plan amendment made with the definition of LPG station, and the zoning plan amendment decisions to open the 100th year Atatürk Cultural Park for construction.

**Gaziantep - Islahiye**

It was learnt that the area where the biggest destruction occurred in the district was a stream bed in the past and was later opened for development. It has been learnt that most of the demolished buildings are 3-4 years old and some of them are not yet inhabited.

As of 13 February 2023, 300-350 buildings were found to have collapsed or severely damaged, causing fatalities. The number of people who lost their lives or the number of damaged or collapsed buildings that did not cause deaths is not known.



Islahiye city centre



Islahiye city centre



Islahiye city centre



Islahiye city centre

In the traditional houses in the district, collapses were generally detected only on the garden walls.

### **Gaziantep - Nurdagi**

All buildings on Alparslan Türkeş Boulevard in the district are heavily damaged or collapsed. On this boulevard, where demolition is intense, construction was limited to 2-3 storeys because the ground bearing capacity was not suitable, but later 6-7 storey construction was allowed.

The number of casualties is unknown.

In Gaziantep, İslahiye and Nurdagi districts are the most intensely demolished areas. City centre While 3rd degree earthquake zone, these districts are defined as 1st degree earthquake zone.



Nurdagi city centre

### **Adiyaman**

More than 2 thousand buildings were demolished in the city. In addition to the buildings built in the recent period, the buildings built after 1990 were also destroyed and heavily damaged.

Many buildings on Atatük Boulevard have been demolished or heavily damaged. Isias Hotel located on this boulevard was also demolished.



Adıyaman city centre



Adıyaman city centre





Adiyaman ISIAS Hotel



Adiyaman city centre



Adiyaman city centre

### **Malatya**

As of 14 February 2023, 1154 buildings collapsed and 1300 people lost their lives. However, it is estimated that the total number of collapsed buildings and the number of people who lost their lives in the city is higher. It is known that most of the collapsed buildings in the city were built before 2000.

Most of the destruction and heavy damage in Malatya occurred after the second earthquake.

It has been observed that most of the buildings in Yakınca and Bostanbaşı neighbourhoods on the city periphery are heavily damaged or demolished. It is known that the heavily damaged or demolished buildings were completed 3-5 years ago; there are some demolished buildings that were completed only 6 months ago.



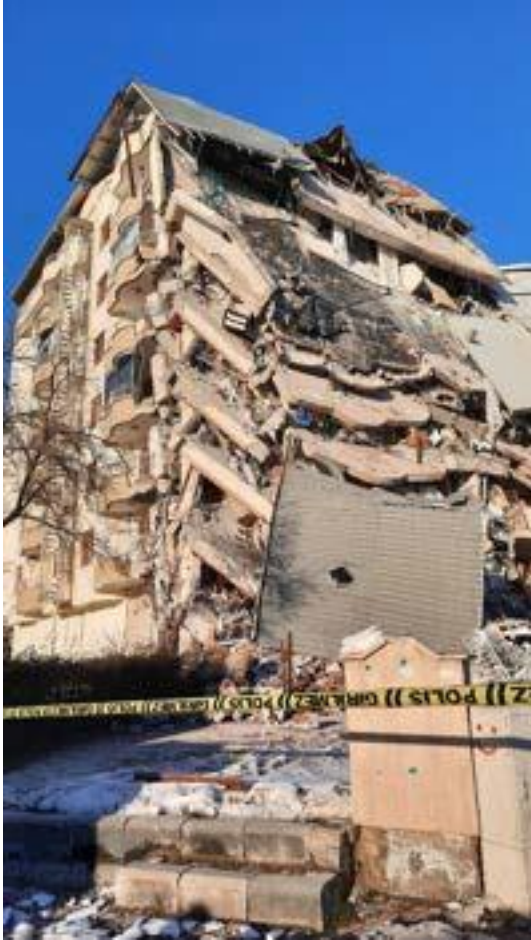
Malatya Bostanbasi Neighbourhood



Malatya Bostanbasi Neighbourhood

Bostanbaşı neighbourhood was used for agricultural purposes for apricot gardens in the past, but in the last 10 years, the zoning plans have been changed and opened to construction, the 5-storey restriction has been removed and the building heights have been left free, that is, h = free regulation has been introduced. The ground of the region is not suitable for high-rise construction.

In most of the damaged or demolished high-rise buildings in the city, it was observed that the storey height was given more (5.5 m) for commercial activities on the ground floors, which caused short columns and soft floor effect in the buildings. It was observed that the reinforcements were not fixed in the damaged buildings and most of the roofs were slipped.



Malatya Bostanbasi Neighbourhood

It was reported that in 2013, a plan amendment was brought to the agenda for the construction of a mosque with a capacity of 10 thousand people in the area used as a disaster and emergency gathering area next to Malatya Metropolitan Municipality, but the project was not implemented as a result of the initiatives of the Malatya Branch of the Chamber of Architects.

After the 2020 Elazığ-Sivrice earthquake, it is known that demolition took place in the areas warned by the Chamber of Architects Malatya Branch for being risky.



Malatya city centre

In rural areas and villages in Malatya, small cattle and cattle were lost due to the destruction of barns and buildings. In the city centre, it was observed that domestic animals remained unclaimed and hungry.



Malatya city centre



Malatya city centre



Malatya city centre



Malatya city centre



Malatya city centre

### **Kahramanmaraş**

There was no damage and destruction in the high areas and mountainous areas, which were the first settlement areas of the city of Kahramanmaraş.

Damage and destruction were experienced in Hayrullah and Yenişehir neighbourhoods where the city expanded, that is, in the settlement areas that developed on the plain.

It was observed that most of the multi-storey buildings on Sandalzade, Azerbaijan and Trabzon Boulevards were severely damaged and collapsed.



Kahramanmaraş city centre



Kahramanmaraş city centre





Kahramanmaraş city centre



Kahramanmaraş city centre



Kahramanmaras city centre



Kahramanmaras city centre

### Kahramanmaras - Pazarcik

It was observed that hammering effect occurred in 6-8 storey buildings constructed in adjacent building layout on the main street known as Adiyaman Road in the city due to post-earthquake building oscillations.

It has been observed that the storey heights of these buildings are higher due to the commercial activities on the ground-floor floors, which creates short columns and soft storey effect in the buildings.



Pazarlık city centre



Pazarcık city centre

### **Kahramanmaras - Elbistan**

In the light of the information received from the region, it is understood that the destruction and damage were intense in Elbistan District.

It is estimated that most of the buildings in the city centre are heavily damaged and unusable, but damage assessment works have not started as of 7 February 2023.

It was learnt that cattle and sheep and goats were lost due to destroyed barns in rural areas and those rescued were lost due to lack of feed and climatic conditions.

### **Diyarbakir**

A total of 7 buildings were demolished in Diyarbakır city centre, 3 of which were illegal buildings. 409 people lost their lives in the city.

Investigations carried out on collapsed or heavily damaged buildings to determine the causes of structural damages;

- illegal construction, structures built without architectural engineering services,
- Adding illegal storeys to buildings in violation of the project,
- short column effect on ground floors due to commercial activities,
- renovations that interfere with the carrier system,
- No basement floor in multi-storey buildings, failure to establish the structure-ground relationship,
- low concrete and iron quality.

## **STRUCTURAL DAMAGES IN PUBLIC BUILDINGS, PUBLIC SERVICES, TRANSPORT AND INFRASTRUCTURE PROBLEMS**

In most of the provinces affected by the earthquake, Government Offices, Governorships, Municipalities, schools, family health centres, hospitals, places of worship and religious buildings, police houses, gendarmerie buildings and lodgings were damaged or destroyed.

It has been observed that public buildings, which are expected to be the structures where needs such as sheltering and coordination centres are met in emergency response and recovery processes after the disaster, have been damaged to the extent that they cannot fulfil these duties.

It was observed that infrastructure services such as electricity, water and natural gas could not be provided one week after the earthquakes. It was observed that motorways and divided highways, airports and railways in the region were damaged due to the earthquake.

### **TOKİ Houses in Earthquake Region**

In Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa provinces affected by the earthquakes, there are 133,759 houses built by TOKİ. In the post-earthquake period, it was announced that 199,739 permanent houses will be built by TOKİ in these provinces.

According to the observations made in the region, it was observed that TOKİ houses were built away from the city centres, generally in high areas, on soils with higher bearing capacity, and therefore structural damages were less.

In Hatay, one of the provinces most affected by the earthquake, structural damages were observed in TOKİ houses, but security forces prevented an inspection in the area.

### **Osmaniye**

It was observed that many mosque minarets were destroyed and buildings were damaged in the city centre. It is also known that a Family Health Centre was heavily damaged.

## Hatay

It was observed that public buildings in the city were also heavily damaged, and the registered building of the Hatay Governorship as well as the reinforced concrete building of the Government Office were heavily damaged. It was learnt that an inspection was conducted in 2012 to determine whether the reinforced concrete building posed a risk.



Hatay Governorship Government Office

As of 12 February 2023, there is no water and electricity supply in Hatay city centre. There is a risk of spread of epidemics due to the lack of cleanliness and hygiene conditions in the city.

On the divided road between Hatay and Gaziantep via Kırıkhan, it was observed that there were fractures due to collapses and elevations due to the earthquake.

Flights cannot be operated in the city due to the breakage of the airport runway and structural damages on the floor of the terminal building.

It was observed that the roofs of TOKİ houses in Altınçay neighbourhood of Hatay had slipped and there were structural damages on the buildings, but security forces prevented an inspection in the area.



Hatay Altincay neighbourhood TOKİ residences





Hatay Altincay neighbourhood TOKİ residences



Hatay Altincay neighbourhood TOKİ residences



Hatay Altincay neighbourhood TOKİ residences



Hatay Altincay neighbourhood TOKİ residences



Hatay Altincay neighbourhood TOKİ residences

#### **Hatay - Belen, Defne and Iskenderun**

It was observed that the building of District Directorate of National Education, one of the public buildings in Belen District, was heavily damaged.

As of 12 February 2023, education, housing and administrative public buildings in Defne District were reported to be at least moderately or severely damaged.

No significant damages were observed at the Bus Terminal in the district and the terminal is actively serving in the evacuation of the city.

Iskenderun State Hospital collapsed with approximately 150 patients, health workers and patient attendants inside. It is stated that 250-300 people lost their lives in the building. It is learnt that an inspection was carried out in 2011 to determine whether the hospital building was at risk.



Iskenderun State Hospital



Iskenderun State Hospital

### **Gaziantep**

It has been learnt that studies are being carried out on the condition of dams and infrastructure in Kahramanmaraş, where some of the drinking water of Gaziantep city is supplied. As of 13 February 2023, it was learned that there were fine cracks in the structure.

The Tarsus-Adana-Gaziantep Motorway was damaged by the earthquake and the section between Nurdagi and Gaziantep is not available as of 13 February 2023 due to collapses and fractures.

Gaziantep Airport was not structurally damaged in the earthquake and is actively used by non-scheduled flights to evacuate earthquake victims who want to leave the city.

Gaziantep Bus Terminal was also not structurally damaged, and bus services started to operate as of the second day of the earthquake. Railway services started to operate in the city as of 11 February 2023.

### **Gaziantep-Nurdagi**

Public buildings were also heavily damaged in Gaziantep Nurdagi District. Gendarmerie and police buildings were heavily damaged in the district.

### **Adiyaman**

In Adiyaman, public buildings in the city centre were heavily damaged or destroyed. AFAD building and Adiyaman Municipality building were also destroyed.



Adiyaman Municipality Building

It was observed that the General Directorate of Forestry lodging building in the city was heavily damaged.



Adiyaman General Directorate of Forestry Lodging Building



Adiyaman General Directorate of Forestry Lodging Building

## **Malatya**

Many school buildings were damaged in Malatya city centre. Malatya Training and Research Hospital and Yeşilyurt Hasan Çalık State Hospital were also damaged.

Malatya is the only city in our country that meets its water needs from natural sources instead of dams. However, KAPTAJ-Yeşilyurt Spring, which provides Malatya's drinking water and mains water, has been flowing turbid as of 14 February 2023 due to the earthquake. Malatya Water and Sewerage Administration officials state that the turbidity is expected to disappear within a month, but it is feared that the source, which is currently flowing at normal flow rate, will change its bed due to the earthquake and dry up.

There are sewerage and water problems in the whole city due to the earthquake. Electricity and natural gas cannot be supplied. It is reported that there is also a water problem in the neighbouring districts and villages.

On the Adıyaman-Malatya Mountain Road passing through Çelikhan, collapses and slides were observed due to the earthquake.

Railway train services continued in Malatya. After the earthquake, earthquake victims who wanted to leave the city were evacuated through non-scheduled services.

Narlı-Pazarcık-Doğanşehir-Fevzipaşa railway stations collapsed in the region and railway workers lost their lives in the rubble. It is estimated that there will be no service on Malatya-Adana line for at least one year due to tunnel collapse.

## **Kahramanmaraş**

No information on damage to public buildings in Kahramanmaraş city centre was obtained.

Gazi Secondary School was heavily damaged in the city.



Kahramanmaraş Gazi Secondary School



Kahramanmaraş-Malatya divided road slides and collapses

### **Kahramanmaraş - Pazarcık**

In Pazarcık District, the middle school building was completely destroyed and debris was seen to be removed.



## **CULTURAL HERITAGE, URBAN AND RURAL HERITAGE**

Many cultural assets were damaged or destroyed in a wide area covering the provinces of Adana, Adıyaman, Diyarbakır, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa. Due to the limitations of the research period and the information received from the representative offices in the region that Şanlıurfa, Diyarbakır and Kilis provinces were less damaged than other provinces, no observations were made in this context.

In addition to monumental cultural assets such as religious buildings, public and defence structures in historical city centres, many civil architecture buildings were severely damaged and destroyed. Very limited information on rural areas could be obtained through the representative offices. Since Turkey's national inventory of cultural assets has not yet been completed and there is a very limited number of registration records, especially for rural architectural examples, it is difficult to even understand the extent of the loss.

It has been determined that many recently repaired monuments could not withstand the destructive effects of the earthquake. In addition to this situation, it has been observed that large-scale destruction has occurred in civil architectural works, which are more vulnerable to earthquakes due to years of neglect and neglect. This situation once again shows the importance of "continuous maintenance" in the protection of cultural assets. On the other hand, it has been observed that the actions defined in the management plans, which are mostly prepared to ensure coordination and coordination among institutions in the protection of "World Heritage" sites, regarding disaster risk preparedness and emergency interventions have not been fulfilled and many cultural heritage assets were left vulnerable especially in the first days after the earthquake.

### **Adana**

No damage was detected on cultural assets in Adana city centre. No information was received on whether there was any damage in Anavarza and Misis archaeological sites.

### **Hatay**

In Hatay, the Government House (Governor's Office), Habib-i Neccar Mosque, Great Mosque, Sarımiye Mosque, Antakya Synagogue, St. Paul Orthodox Church and Hatay Assembly were severely damaged or largely destroyed. Today, these sites are located within the borders of

urban and/or archaeological sites in Anatolia.

Kurtuluş Street, which was the first street to be illuminated, and the historical texture in and around Kurtuluş Street were also largely devastated and it was determined that the registered civil architecture works were heavily damaged.

20 February 2023 Following the earthquake in Hatay, the heavily damaged Government House (Governorship) building was demolished. In addition, heavily damaged buildings and registered civil architecture works in the historical texture in and around Kurtuluş Street were demolished.



Hatay Government House (Governorship) damaged after the earthquakes of 6 February 2023



The view of Habib-i Neccar Mosque in Hatay after the earthquakes of 6 February 2023

(Photograph: Assoc. Dr. Koray Güler)



View of Habib-i Neccar Mosque, Hatay, after the earthquake of 20 February 2023



Post-earthquake view of Sarimiye Mosque in Hatay (Photograph: Assoc. Prof. Dr. Koray Güler)



Examples of damages to civil architecture works in the historical city centre of Antakya after the earthquake of 6 February 2023 (Photograph: Assoc. Prof. Dr. Koray Güler)



Examples of damages to civil architecture works in the historical city centre of Antakya after the earthquake of 20 February 2023 (Photograph: Assoc. Prof. Dr. Koray Güler)



Examples of damages to civil architectural works in the historical city centre of Antakya caused by the earthquake of 6 February 2023



Examples of damages to civil architectural works in the historical city centre of Antakya caused by the earthquake of 20 February 2023

### **Gaziantep**

Structural cracks were observed in the bastions of Gaziantep Castle and collapsed sections of the city walls. It was also observed that the minaret of the Şirvanlı Mosque, located near the castle, collapsed and a part of the body walls were damaged. Similarly, it was observed that the dome and minarets of the Kurtuluş Mosque collapsed.





Damages observed in Gaziantep Castle after the earthquake (Photograph: Assoc. Prof. Dr. Koray Güler)



Damages observed in Kurtuluş Mosque after the earthquake

### **Adiyaman**

The Grand Mosque in Adiyaman was heavily damaged and only two body walls of the building survived. Similarly, the Old Palace Mosque in the city centre was also heavily damaged and its minaret collapsed.



Damages observed in Adiyaman Ulu Mosque after the earthquake (Photograph: Assoc. Prof. Dr. Koray Güler)



Damages observed in Adiyaman Eski Saray Mosque after the earthquake

## Malatya

The New Mosque, located in the city centre of Malatya, has been largely demolished. Hairline cracks and plaster spalling were observed in the Government House (Governorship) and the Station Building, which are part of the city's architectural heritage of the Republican period.

The Chamber of Architects filed a lawsuit against the decision of the Sivas Regional Board for the Protection of Cultural Assets regarding the landscaping of the registered building Yeni Mosque.

In addition, it is understood that although it is stated in the decisions of the Regional Board for the Protection of Cultural Assets regarding the Yeni Mosque that the building was damaged in previous earthquakes, most recently in the 2020 Elazığ-Sivrice earthquake, the necessary measures were not taken.



Damages observed in Malatya Ulu Mosque after the earthquake (Photograph: Assoc. Prof. Dr. Koray Güler)

### **Kahramanmaras**

The minaret of Kahramanmaraş Ulu Mosque collapsed and the last congregation area was severely damaged. Similarly, it was observed that the minaret of Arasa Mosque was also destroyed. Damages were also observed in the civil architecture works in the city centre and the castle.



Damages observed in Kahramanmaraş Ulu Mosque after the earthquake  
(Photograph: Assoc. Prof. Dr. Koray Güler)

### **Hatay-Payas**

In Sokollu Complex, a work of Mimar Sinan in Payas, the minaret of the mosque was destroyed. No damage was observed in the castle. In the caravanserai section, structural cracks and plaster spillages were observed in the portico domes where it was understood that seams were made in previous restoration applications.



Damages observed in Payas Sokollu Mosque after the earthquake (Photograph: Assoc. Prof. Dr. Koray Güler)

### **Hatay-Iskenderun**

There are partial collapses in the former French Embassy building, which is now used as Mithatpaşa Secondary School in Iskenderun. The Latin Catholic Church, which is still in active use today, was largely destroyed, while the Orthodox Church was severely damaged.



The former French Embassy, which is used as Iskenderun Mithatpaşa Secondary School, was damaged after the earthquake.



The former French Embassy, which is used as Iskenderun Mithatpaşa Secondary School, was damaged after the earthquake.



Iskenderun Latin Catholic Church after earthquake damage



Iskenderun Latin Catholic Church after earthquake damage



Iskenderun Orthodox Church

**Evaluation:**

In this section, the main determinations and issues that should be taken into consideration and paid attention to by both official institutions and professional chambers, non-governmental organisations and volunteer experts are specified.

1- It is observed that cultural assets in the region remained largely defenceless after the disaster, and the relevant institutions started to take precautions after the warnings made.

2- In order to be able to carry out restoration applications correctly in damaged / heavily damaged historical buildings, efforts should be made to protect and document the original building parts scattered around due to the earthquake. For this reason, the ruins of historical buildings should be kept in their own parcel, if possible, so as not to block the streets. However, the piling of building rubble along the walls of neighbouring buildings within the parcel may cause damage to the surviving buildings with little damage due to moisture and water from the rubble after rain and snow. In the field surveys conducted in the region before, it was observed that the rubble of collapsed buildings also caused great damage to the neighbouring buildings over time. For this reason, it would be appropriate not to allow building rubble to approach the walls of neighbouring buildings within the parcel.

3- Ensuring that the walls, floors and ceilings of the standing but heavily damaged buildings are kept in place with suspension systems will be useful both for documentation studies for restoration purposes and for in-situ conservation without demolition.

4- In multi-layered cities such as Antakya, it is important to consider the potential archaeological layers that may emerge especially at the basement level during the removal of the debris of recent buildings that are not registered, as well as the buildings registered as cultural assets to be protected in the urban and/or archaeological protected area.

5- In the event that electricity, clean water, sewerage systems need to be renewed, all road lines to be excavated should be studied under the supervision of an archaeologist to document archaeological deposits, if any.

6- From Antakya to Şanlıurfa, from Kahramanmaraş to Malatya, there are also very qualified rural architectural textures in the whole region damaged by the earthquake as a



document of the experience of the last two centuries.

subject. Although various institutions and researchers have carried out documentation studies in some of these areas from time to time, these documentaries are only known from publications in order to be recorded in the National Cultural Inventory. Since the vast majority of these rural textures with very different construction techniques and architectural forms are not registered, they are not legally defined as "cultural assets". Therefore, the Ministry of Culture and Tourism has no responsibility for their protection. However, it is necessary to develop a sensitivity towards the protection and documentation of these structures and textures, which are as valuable as urban heritage. In this context, efforts should be made to ensure that rural buildings, which are not registered in the future, but have cultural heritage value, are rapidly registered if necessary and benefit from public restoration budgets.

6- No conservation practice should be initiated until the current static conditions of the cultural assets and the grounds where they are located, which have been severely damaged by the earthquake, have been evaluated by experts from different disciplines such as architects, civil engineers, geologists and archaeologists. It is of great importance that a proper planning to be shaped with the participation of stakeholders such as professional chambers, universities, central and local administrations should be made and implementation should be started with prioritisation and phasing decisions for the rehabilitation of historical environments, and that there should be no rush to take steps without considering these issues.

In this context:

- a) It would be realistic to create conservation plans with the awareness that documentation, analytical research and project development processes require intensive labour and time before restoration in order to protect a very dilapidated historical building in a qualified way.
- b) Especially in urban protected areas, even if the residential buildings are similar to each other, studies should be carried out to prepare unique projects that produce solutions for the problems of that historical building.
- c) Due to the mass demolitions of building islands, the basic principles should be to define the traces of building islands and parcel building relations according to the original situation in well-preserved urban tissues such as Antakya, and not to create new

designs in these areas that do not comply with the original texture, as in Istanbul Sulukule (Neslişah and Haticesultan Neighbourhoods).

## **MIGRATION, SOCIAL LIFE AND ECONOMIC ACTIVITIES**

Approximately 14 million citizens in Adana, Adıyaman, Diyarbakır, Elazığ, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa were affected by the earthquakes of 6 February 2023.

In Adıyaman, Hatay, Kahramanmaraş and Malatya, social and social life and economic activities have completely stopped. The remaining population in the region has settled in their homes on the outskirts of the cities or in villages, and meets their housing and other living needs in this way.

In the city centre of Hatay, it was observed that the majority of the population had left the area, while the remaining citizens were waiting for the rescue of their relatives trapped under the rubble.

It was reported that out of a total population of 812 thousand people in Malatya, approximately 450 thousand people migrated and left the region after the earthquake.

In cities such as Adana and Gaziantep, it was observed that citizens left the region for a short time due to earthquake conditions and fear.

Citizens who left the region due to the inability to establish emergency and temporary shelter settlements in the region or the inadequate number and infrastructure services of the settlements established in the region travelled to provinces that they considered to be safe in terms of disaster risks, located in close proximity, and where they had acquaintances and relatives.

Due to the population's desire to settle in Mersin, Kayseri and Ankara, these cities are experiencing high increases in the prices of food and living necessities and housing rents.

## PROFESSIONAL ACTIVITY IN EARTHQUAKE ZONE AND CHAMBER OF ARCHITECTS BUILDINGS

In the region affected by the earthquake, where approximately seven thousand architects are engaged in professional activities, the Chamber of Architects has 7 Branches and 5 Representative Offices.

In the post-earthquake investigations, social and social life as well as economic and professional activities came to a halt.

In the determinations and evaluations made regarding the buildings where the units of the Chamber of Architects provide services, it was understood that the buildings where Adana Branch, Diyarbakır Branch, Mardin Representative Office, Şanlıurfa Branch and Siverek Representative Office operate were not damaged.

It was informed that Poyraz Business Centre, where the Chamber of Architects Osmaniye Representative Office is located, was built after 2010. It was observed that there were structural damages in the building, but it could not be examined since no damage assessment was made.



Business Centre building where the Chamber of Architects Osmaniye Representative Office is located

Although there is no damage to the registered building, which belongs to our Chamber, where the Chamber of Architects Hatay Branch operates, there is heavy damage to the buildings next to the building and on the street where it is located. There is also a need for a re-evaluation after the earthquake in Hatay on 20 February 2023.



Chamber of Architects Hatay Branch Registered Historical Building

Structural damages were observed in the Efes Business Centre, where the Gaziantep Branch of the Chamber of Architects is located, which was completed in 2002, but the building could not be examined since no damage assessment was carried out.



Business Centre building where the Chamber of Architects Gaziantep Branch is located



It has been determined that the building owned by our Chamber, where the Chamber of Architects Kahramanmaraş Branch operates, was not damaged.



Chamber of Architects Kahramanmaraş Branch Building



Chamber of Architects Kahramanmaraş Branch Building

Structural damages are observed in the building where the Adıyaman Representative Office of the Chamber of Architects operates. The building, which is thought to be heavily damaged, could not be examined since no damage assessment was carried out.



The building where the Adıyaman Representative Office of the Chamber of Architects is located

Since the building where the Chamber of Architects Malatya Branch operates was heavily damaged, the building could not be examined in detail.



Chamber of Architects Malatya Branch

Structural damage was observed in the Chamber of Architects Iskenderun Representative Office building, but the building could not be examined since no damage assessment was made. There is also a need for re-evaluation after the earthquake in Hatay on 20 February 2023.



Chamber of Architects Iskenderun Representative Office

## CONCLUSIONS AND EVALUATIONS

### **New Zoning Scheme**

Since 2002, the political power has put into practice consumption and growth-oriented investment projects in order for our cities to have a structure oriented towards finance and service sectors; and has identified urban and rural areas, natural assets, protected areas, forests, coasts, national parks, natural protected areas, pastures, plateaus, winter pastures and the entire environment as rent areas.

Urban areas were determined as a means of capital production; central and local government policies that substituted urban rent for the priority of public interest in accordance with restructuring dynamics became dominant, and legal regulations were introduced to pave the way for construction in all urban and rural areas.

Within the framework of the capital accumulation model through the construction sector, areas where unplanned construction was tolerated by central and local governments in the past and illegal constructions have gained importance as new investment areas; they have become the source of capital accumulation and real estate rent through urban transformation practices.

### **Building Production and Inspection Process**

Multiple zoning applications were allowed by protecting private interests instead of public interest, qualified architectural and planning services were prevented, and building inspection was transferred to the private sector with an understanding that ignores the state's inspection responsibilities on behalf of the public.

Professional rights and authorisations, authorship and copyrights are shown as bureaucratic procedures and obstacles; the responsibilities of the problems experienced due to the deficiencies in the institutional structures of the relevant administrations and unsupervised zoning practices are attributed to members of the profession.

The access of qualified architectural, engineering and planning services to the society and the fulfilment of the responsibilities of professional organisations, which are the

guarantee of the competence of members of the profession, towards the society are prevented.

The right to live in a healthy environment and the right to housing, which is the most fundamental right, has become almost impossible due to "planning and architecture" practices that have been turned into a component of capital and consumption-oriented policies in every aspect.

### **Zoning Amnesty**

Despite the fact that most of the illegal buildings that were forgiven with the laws enacted over the years were destroyed in the 1999 Marmara and 2011 Van Earthquakes and thousands of citizens lost their lives; in 2018, a new zoning amnesty under the name of "Zoning Peace" was put into effect by the government.

All illegal structures, including buildings and facilities built on coastal areas, agricultural lands, forest areas, drinking water basins and historical, natural and archaeological sites, whose plans and licenses were cancelled by the judiciary, and each of which is an "urban and environmental crime" by granting privileged development rights, have been legalised.

Citizens were given permission to use risky buildings regardless of whether they are located in disaster-prone areas or in river beds; whether they are built on coastal areas, agricultural lands, forest areas, drinking water basins and historical, natural and archaeological sites.

The safety of life and property of citizens has been jeopardised and illegal construction has been encouraged in buildings without building safety, which have not undergone planning, architecture and engineering processes, and whose technical health and safety conditions are uncertain.

2022 Through the new "Zoning Amnesty" submitted to the Turkish Grand National Assembly in October, it is known that populist practices that will lead to urban developments that endanger the health and life safety of the society, and that will cause natural events to turn into disasters and cause many people to lose their lives are wanted to be put into effect again and unlimitedly.

However, it has been emphasised by our Chamber that the social and economic losses caused by earthquakes in our country, whose entire territory is under seismic conditions, require serious measures to be taken.

### **Professional Expertise and Professional Chambers**

Political pressures and neo-liberal approaches have triggered processes that will create great risks for today and the future by ignoring professional organisations, non-governmental organisations and specialised areas of the profession and by excluding the scientific studies of higher education institutions.

The reports prepared by professional organisations, universities and even public institutions on the regulations and projects put into effect with an understanding that bypasses legal and public supervision have been ignored.

Changes have been envisaged in the public and autonomous structures of professional organisations, which are seen as an obstacle to the inconsistent and unlawful policies pursued, and which continue their work to ensure that society has access to quality architecture and planning services and that these services are carried out for the public good, and these services and production processes have been devalued.

All these regulations, by restricting professional rights, create conditions that will prevent qualified services provided by experts from reaching the society and professional organisations, which are the guarantee of the competence of professionals, from fulfilling their responsibilities towards the society; they make architectural services a component of central policies with the dimensions of design, implementation, management and supervision.

### **Disasters, Architecture and Urbanisation**

On 17 August 1999, twenty-four years have passed since the Kocaeli-Gölcük-centred Marmara Earthquake, which was one of the biggest disasters our country has experienced in the last century with its magnitude, the extent of the area it affected and the losses it caused, and the 12 November 1999 Düzce Earthquake that followed.

Following these earthquakes, in which more than 20,000 lives were lost, the earthquakes in Van in 2011, Istanbul in 2019, Manisa, Elazığ, Van and Izmir in 2020 showed that the capital-oriented planning, urbanisation and construction policies that caused destruction and losses continued despite the suffering and losses.

Following the Marmara Earthquakes and the Van Earthquake, the "Law on the Transformation of Areas under Disaster Risk" was put into force in 2012 with the justifications of making the existing construction safe and identifying and renewing the buildings that pose a danger. In 2016, in order to ensure the implementation of the practices throughout the country without public supervision, public order and security, damage to structures and infrastructure, and illegal structures were included in the grounds for transformation, paving the way for the implementation of Law No. 6306 in all areas deemed appropriate by the Council of Ministers.

In the intervening period, not only were our cities not prepared for disasters, but by the Ministry of Environment, Urbanisation and Climate Change and the Housing Development Administration (TOKİ), all urban and rural areas were opened for development, natural, cultural and historical values were transformed into capital and investment instruments, gathering areas planned to be used in case of a possible disaster were allocated to investors and capital owners, and no harm was seen in building business centres, shopping malls, mass housing and stadiums in these areas.

Although 60 per cent of the existing building stock in our country has not received architectural and engineering services and more than 10 million buildings are unhealthy and not resistant to disasters; only 213 thousand buildings and 896 thousand 350 independent units have been identified as risky buildings since 2012.

Multiple zoning applications were allowed by protecting private interests instead of public interest, qualified architectural and planning services, which are the prerequisite for healthy and safe building production processes, were prevented, and building supervision was transferred to the private sector with an understanding that ignores the state's supervision responsibilities on behalf of the public.

In the 1999 Marmara and 2011 Van Earthquakes, despite the fact that most of the illegal buildings within the scope of the previous zoning amnesties were destroyed and thousands of citizens lost their lives; a new zoning amnesty under the name of "Zoning Peace" was put into effect in 2018.



26 billion 151 million 389 thousand for 3 million 119 thousand 947 illegal and illegal buildings, regardless of whether they are built on areas under disaster risk, coastal areas, agricultural lands, forest areas, drinking water basins and historical, natural and archaeological sites

263 TL building registration certificate fee was charged and citizens were allowed to use risky buildings. A total of 7 million 393 thousand 413 independent sections, which are unsafe, have not undergone planning, architecture and engineering processes, and whose health and safety conditions are technically uncertain, were issued certificates.

While Istanbul, which is under earthquake risk, is one of the provinces where building registration certificates were given to illegal buildings with the Zoning Amnesty, the Ministry of Environment, Urbanisation and Climate Change admitted that the earthquake resistance of these buildings, which were documented to be illegal and contrary to zoning, was not inspected and left the responsibility to the building owners.

In 10 provinces affected by the 7.7 and 7.6 magnitude earthquakes on 6 February 2023, 290,929 building registration certificates were issued within the scope of zoning amnesty; citizens were encouraged to live in illegal and earthquake-resistant buildings that violated zoning rules.

As a result of the analyses and evaluations conducted in the region after the earthquakes, it was observed that the effects of the earthquakes were more intense in Adiyaman, Hatay, Kahramanmaraş and Malatya. It is observed that 43% of the building registration certificates issued within the scope of zoning amnesty in the region, 126 thousand building registration certificates, were issued in these cities.

The state is obliged to provide all citizens with qualified living environments under equal, healthy and safe living conditions. It is imperative that the measures to be taken for successful recovery processes in epidemic, disaster and crisis conditions are based on scientific principles and facts, in the public interest; and that the policies to be developed on disaster management are formulated by taking into account scientists, professional chambers, academic institutions and relevant expertise.

The rent-oriented planning, urbanisation and construction policies that have cost and continue to cost the lives of many citizens and have caused great destruction and losses must be abandoned.

In this context, it is imperative that the necessary studies on the historical and cultural settlement areas, geological structure, natural resources and transportation facilities of the region be carried out together with all relevant institutions and organisations, professional chambers, universities and civil democratic society organisations, and that plan implementations be reconsidered on this basis.

Within the scope of the observations and investigations made in the region, the main causes of structural damages in urban areas are similar to the earthquake damages experienced in the past;

- Development plans and plan amendments made without taking disaster data into consideration,
- Encouraging illegal construction through zoning amnesty, projects and applications contrary to zoning rules, illegal constructions
- Opening agricultural lands and soils with low bearing capacity for construction,
- Exclusion of qualified architecture, engineering and planning services from the building production and inspection process,
- Insufficiency of technical staff and lack of supervision in vocational specialities,
- Failure to establish the structure-ground relationship, construction on grounds that are not suitable for the load of the structure,
- Disruption of the soil-structure relationship by increasing the building load with high-rise buildings,
- Soil liquefaction,
- Damages caused by not selecting a suitable foundation,
- Architectural and structural system designs that do not take seismic loads into account,
- Faulty material selection, workmanship and applications,
- Low concrete quality,
- Use of flat reinforcement and insufficient number of reinforcement,
- Use of hollow and beamless floors without taking the necessary precautions,
- Damage caused by interventions made during use,
- Modifications made due to commercial functions (market, gallery, office, etc. functions) on the ground-floor of the buildings, wide openings, mezzanine floors and different floor heights, resulting in soft floor and short column effect,
- The occurrence of a hammering effect due to the lack of the necessary arrangements in the adjacent building layout,

as a "realisation".

These practices, which cause structural damage and losses, should be abandoned in post-earthquake recovery processes;

- Ensuring that the Chamber of Architects, related professional chambers affiliated to TMMOB and local and central administrations carry out their investigations and studies in the region in cooperation and coordination,
- Qualification of disaster management and coordination by taking into account the adversities and experiences in the region,
- Carrying out activities to transfer the experience and accumulation of all disasters experienced in the past and the institutional memory of the relevant organisations to future generations,
- Taking necessary measures for the protection of traditional structures and social life in rural areas and village settlements,
- Taking measures to maintain social life and economic activities in the region,
- Protecting the natural environment in the region, especially Hatay Milleyha Bird Sanctuary and its surroundings, from the debris and wastes of demolished buildings,

such important issues and topics need to be taken into consideration.

As stated in the evaluations and determinations shared with the public after the earthquakes experienced in the past; it has been observed that the main factors of the destruction experienced in the region are unplanned construction, failure to provide access to qualified architectural and engineering services, use of deficient and poor quality materials, privatisation and dysfunctionalisation of the building inspection process that should be carried out on behalf of the public, failure of local governments and central administration to fulfil their public inspection duties, and encouragement of illegal and unsafe construction with practices such as zoning amnesty.

Due to the ongoing earthquakes in the region, moderate and severe damage to urban and rural building stock and winter conditions, in order to meet the vital needs and to secure the lives of the people of the region, it is urgently necessary to complete the identification and assessment of the risks arising from damaged buildings, as well as emergency search and rescue operations and assistance after the disaster.

Making the existing constructions in urban and rural areas safe and primarily identifying and demolishing the buildings that pose a danger, analysing the existing building stock, damage

It is an urgent necessity to report the condition of the damaged structures by specialised professionals. These structural assessments and evaluations are an absolute necessity in order to prevent and minimise the risks posed by damaged structures.

In addition, it is important to take measures for the rapid elimination of the social, social, psychological and economic negativities caused by the earthquake and to ensure the effective participation of both professional chambers and non-governmental organisations in the tasks to be performed by public institutions.

In this context, as it has been repeatedly emphasised in the reports and declarations prepared by the Professional Chambers, it has once again been concretely understood that it is imperative to establish a management system "in accordance with modern and scientific principles based on the principle of cooperation and coordination with all institutions and organisations" related to disaster management.

As the Chamber of Architects,

We honour the citizens we have lost in disasters; we wish the wounded to recover and the wounds to be healed as soon as possible.

Within the scope of our professional expertise and social responsibilities, we will continue our efforts to provide our contribution and assistance to post-disaster response and detection activities,

In addition, we share with our esteemed public that we will continue our work with determination in line with the public and public interest with the slogan "Chamber of Architects is at the Service of Society" for the creation of healthy and safe urbanisation and living environments.

It is respectfully announced to our valuable public opinion.

**TMMOB CHAMBER OF ARCHITECTS**