

ASIAN DISASTER REDUCTION CENTER

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Turkey

1. General Information

1.1 Geographical data

Turkey is a transcontinental country located mainly on the Anatolian peninsula in Western Asia, with a smaller portion on the Balkan peninsula in Southeast Europe. East Thrace, the part of Turkey in Europe, is separated from Anatolia by the Sea of Marmara, the Bosphorous strait and the Dardanelles. The Asian part of the country - Anatolia is a high hilly plateau with narrow coastal plains. Its northern part is covered by the Pontic and K rođlu mountain ranges, the southern by Taurus Mountains. Eastern Turkey has a more mountainous landscape. The rivers Euphrates, Tigris and Aras spring there. Anatolia is surrounded by the Black Sea to the north, Aegean Sea to the West and the Mediterranean Sea to the south. The European part is covered by parts of Eastern Thrace plane and Strandzha mountain. It is separated by Anatolia (Asia Minor) by the Black Sea, Bosphorus, Marmara, Dardanelles and Aegean Sea. Turkey is bordered by Greece and Bulgaria to its northwest; Georgia to its northeast; Armenia, the Azerbaijani exclave of Nakhichevan and Iran to the east; and Iraq and Syria to the south, covering the area of 785,347 square kilometers with a total coastline of 8,430 km. Istanbul is the largest city while Ankara is the capital (Figure1).



Figure 1. Geographic Location of Turkey

1.2 Climate information

The climate in Turkey varies according to the region. Generally, the country's climate is moderate. The Black Sea region is moderate and rainy; the south and Aegean region feature a Mediterranean climate; and the central, east and southeast regions have a continental climate. Most of the coastal areas have a high level of relative humidity during most of the year which makes hot weather feel hotter and cold weather feel colder than it actually is.

1.3 Demographic data

Turkey is divided into 81 administrative provinces and 7 geographical regions (Figure 2). The first census in Turkey was conducted in 1923; the census had been conducted in every year ending with 0 and 5 digits during the period falling between years 1930-1990. According to the results of the last 2016 Address Based Census, the population of Turkey is 82.003.882.



Figure 2. Regions of Turkey

While the male population is 41.139.980 people, the female population is 40.863.902 people. According to this, 50.2% of the total population is male and 49.8% is female. In 2018, the ratio of the population in the 15-64 age group (working age) increased by 1.4% compared to the previous year and was realized as 67.8%. The proportion of the 0-14 age group, defined as the child age group, declined to 23.4%, and the proportion of the population aged 65 and over increased to 8.8%. Annual population growth rate was 8 12.4 in 2017 and 1 14.7 in 2018.

According to TurkStat data, population density is expressed as "A number of people per square kilometer," Turkey in general and has increased by 2 to 107 people in comparison for 2017. Istanbul is the province with the highest population density with 2,900 people per

square kilometer. This is respectively followed by Kocaeli with 528 people and İzmir with 360 people. The province with the lowest population density is Tunceli with 12 people per square kilometer as in the previous year. The population density of Konya, which ranks first in terms of surface area, is 57 and the population density of Yalova with its smallest area is 310 people. In 2017, the proportion of those residing in provincial and district centers was 92.5%, which was 92.3% in 2018. The rate of residents living in towns and villages was 7,7%.

1.4 Economic

Turkey is a free market economy that can change hands in the process of the competition rules, leading the economy's private and public sector to play a regulatory role in the implementation of liberal foreign trade policy as the barrier between the goods and services to individuals and institutions.

A great emphasis has been given to structural reforms in the economy in recent years in Turkey. Over the past period, the privatization process has accelerated, which brought order to the public finances as well as agriculture. Different enterprises starting from the financial markets, social security, significant reforms in sectors such as energy and communication were carried out.

Infrastructure of economic institutions has been enhanced through reforms, and the creation of autonomous institutions economy against the fluctuations that may occur in the international market has become more resistant. Capital markets have been revised in accordance with the approaches to the modern era, and most bureaucratic obstacles have been removed, or have been brought to the minimum size.

Economic Developments: with the world's 18th and Europe's 7th largest economy, Turkey, which is an active member of the G-20, represents one of the most powerful economies in the world.

The Turkish economy achieved a period of economic slowdown in 2008 and 9.2% respectively in 2010 and 2011 after shrinking in 2009 and 8.5% growth rate, the economy contracted in many countries due to the global financial crisis. In the 2002-2014 period, due to the average GDP growth rate of 4.9% and 5.4% in 2010-2014, development plants were prepared. In the first nine months of 2015, the growth rate was achieved by 3.4%. In 2017, it was realized as 7,4% and as 2,6 % in 2018. In this context, the per capita GDP in the year 2002 reached 3.492 US dollars and in 2018 10.000 US dollars.

Medium-Term Programme (2016-2018), based in Turkey, is 2,3% in 2019, while in 2020 is expected to capture the growth rate of 3,5 and 5% in 2021.

Foreign Trade: Turkey has been pursuing a growth-oriented trade policy since the 1980s. The economic reforms carried out by import restrictions have been lifted, protectionist policies released and foreign exchange transactions reduced.

As a result of the economic reforms implemented in recent years, volume and structure of the trade have changed greatly.

In 2015, Turkey's trade volume reached 351 billion US dollars, while exports were realized as 144 billion US dollars. The main target export for the year 2023, the centenary of the founding of the Republic of Turkey, is to increase the level of 500 billion US dollars.

Turkey's foreign trade statistics for the last five years are presented below in Figure 3.

	2014	2015	2016	2017	2018
Export	157,6	143,9	143,9	143,9	168,1
Import	242,1	207,2	207,2	234,1	223,1
Capacity	399,7	351,1	351,1	392,0	391,2

Source: Turkish Statistics Institute

Figure 3. Turkey`s Foreign Trade

Tourism: due to its rich geography and historical riches that Turkey has, it also has a strong infrastructure not only in coastal tourism, health, culture, religion, sports, caves, hunting, upland and in areas such as conference tourism. Located between the world's top 10 tourism destinations in 2018, 45 million foreign visitors have made entry to Turkey, and tourism revenues reached 29,5 billion dollars.

Monetary Policy: the monetary policy implemented in Turkey has played an important role in controlling inflation over the last decade and achieving macro-economic stability. Inflation, which is one of the priorities of the government in the last 30 years, reduced to single digits in the middle of the year 2000.

Consumer price index became 20,30% in 2018.

2. Natural Disasters in Turkey

2.1 Natural Hazard Profile

Turkey, due to its geological and topographic structure and climatic features, frequently faces natural disasters. Besides loss of lives, natural disasters also bring about significant economic loss for Turkey (Özmen, 2005).

Various natural disasters often occur in Turkey at various times. Earthquakes, floods, landslides, avalanches and rock falls are among the most frequent disasters experienced in Turkey (Ildir, 1995).

Due to its tectonic and geological structure, topography and climatic features, Turkey time to time faced various natural disasters (Table 1). In consideration of probable and potential disasters, such disasters could result in considerable loss of lives, injuries and loss of property. Taking the geological and geomorphological structure of our country into account, earthquakes being in the first place, various disasters such as landslides, floods, overflows, and rock falls are experienced. Besides, forest fires and erosion are among important natural disasters that Turkey face. These disasters also bring about important environmental problems.

Number of people lost their lives in Turkey at natural disasters occurred in the last 70 years is 100.000, number of damaged houses is 600.000, and number of houses affected from earthquakes by some means is around 500.000. 1000 people on average die at earthquakes each year, 2100 injured and 7000 buildings damaged (Keleş, 2002; Erdik, 1999; Kiper, 2001).

Table 1. Some of Natural Disasters Occurred in Turkey (2000 - 2015)

Disaster Type	Number of Disasters	Loss of Lives	Injured	Number of Demolished Buildings	Number of Damaged Buildings
Landslide	3.158	17	9	231	4.217
Earthquake	1.007	659	4.258	2.479	90.379
Flood	809	72	47	201	33.295
Avalanche	497	33	28	13	122
Extreme Winter Conditions	619	131	797	0	0
Storm/Typhoon	1.398	172	152	4	883
Fire	1.507	22	34	2	124
Total	8.995	1.106	5.325	2.930	129.020

Source: Republic of Turkey, Prime Ministry Disaster and Emergency Management Authority

As seen in the above table, natural disasters caused considerable loss of lives and property even in recent history of Turkey. Because of natural disasters such as earthquakes, landslides, floods, avalanche, extreme winter conditions, storms and fires, over 60.000 people died in Turkey since the beginning of 20th Century, 35.000 people injured, over 145.000 buildings demolished, and over 1.350.000, buildings damaged (TR, Mol, Disaster and Emergency Management Authority).

2.1.1 Earthquake

Turkey has frequently suffered from major damaging earthquakes since the last century. Epicenters of this destructive earthquakes with magnitudes greater than 5.5 (Ms) that occurred in the period 1900-1995 and present earthquakes with magnitudes greater than 4.0 from 1989 to 1995 were relocated to understand the long-term variations in seismic activity and to compare with present seismic activity. They are particularly concentrated in the segment boundaries of the main active faults and this shows that there are fourteen or fifteen probable spatial seismic gaps enraptured in the last century. The present earthquakes have occurred at the boundaries of these enraptured segments which are the probable sites of the next earthquakes to be occurred in the future. These seismic gaps represent doughnut pattern which is a kind of temporal seismic gap in the present seismicity from 1989 to 1996. Based on the relocated epicenters of these earthquakes, these boundaries have revealed to distinguish seismic segments along the main active tectonic lines. These segmentation will provide a basis for earthquake hazard analysis in the near future by using initiation and termination points of the ruptures that control the rupture lengths determined in this study.

The distribution of the seismic gaps which deserve attention mentioned above are as follows with respect to the main active tectonic regions:

- 4 gaps in the Greek Cypriot Administration of Southern Cyprus arc region (Gökova Bay, northern part of Antalya Bay, the segment between Antalya Bay and Arnavut prominent of Cyprus and Zafer prominent of Cyprus and İskendurun Bay,
- 2 or 3 gaps in the Eastern Anatolian Fault (the segment between Ceyhan and Türkoğlu junction, the segment between Türkoğlu junction and Çelikhhan and the Hazar lake segment)
- 3 gaps in the North Anatolian Fault (the segment between Karlıova and the Erzincan segment, the Geyve segment and 1894 segment)
- 4 gaps in the East Anatolian Contractional province (Yüksekova segment, Van segment, Ardahan segment and Çayırılı-Aşkale segment)
- 1 gap in the Aegean Graben System (the segment, northwest of Argithani)

Temporal (20-year intervals) and spatial variations in seismic activity over past century in and around Turkey were investigated in terms of long-term earthquake forecasting to provide a basis for short-term prediction. Briefly summing up the activity this period, there was (1) an active period (1900-1920) prior to the great Erzincan earthquake ($M_s=7.9$), which is the biggest quake in Turkey, (2) active period (1921-1940) of the eastern part of the North Anatolian Fault including the great Erzincan Earthquake of December 26, 1939 and increasing activity in Greek Cypriot Administration of Southern Cyprus arc region, (3) the western part of the North Anatolian Fault is very active in the period of 1941-1960 after the 1939 earthquake, (4) the subsequent quiescent period (1961-1980) in the NAF, increasing activity in the eastern segment (Varto segment) of the 1939 rupture and decreasing activity in the subduction zone and (5) Overall quiescent period from 1981 up to present and gradually increasing activity in the Eastern Anatolian Fault that is the most probable site of the next earthquake sequence in the coming century.

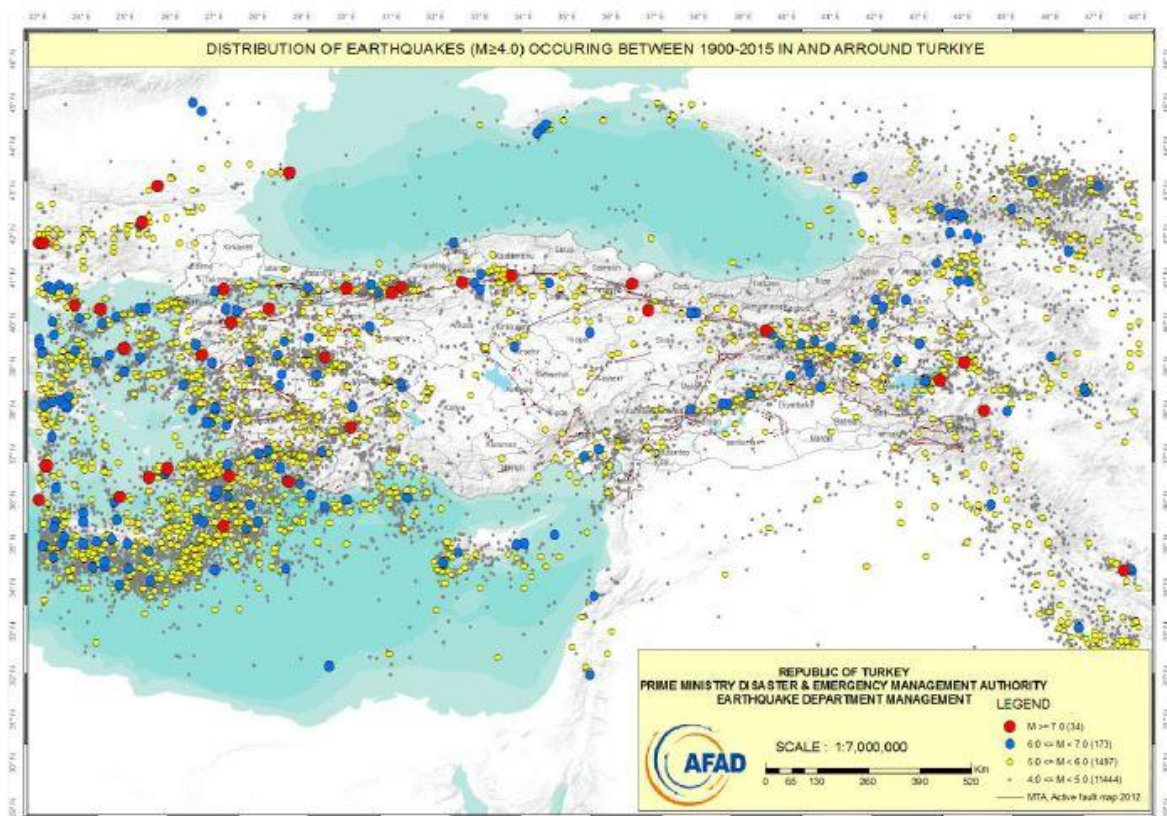


Figure 4. Earthquakes ($M>4.0$) Occurring 1900-2015 in Turkey

As shown in Figure 4, earthquakes bigger than $M 4.0$ are concentrated along the main fault zones; the North Anatolian Fault System, East Anatolian Fault System, Aegean Graben System and Greek Cypriot Administration of Southern Cyprus Arc.

2.1.2 Flood

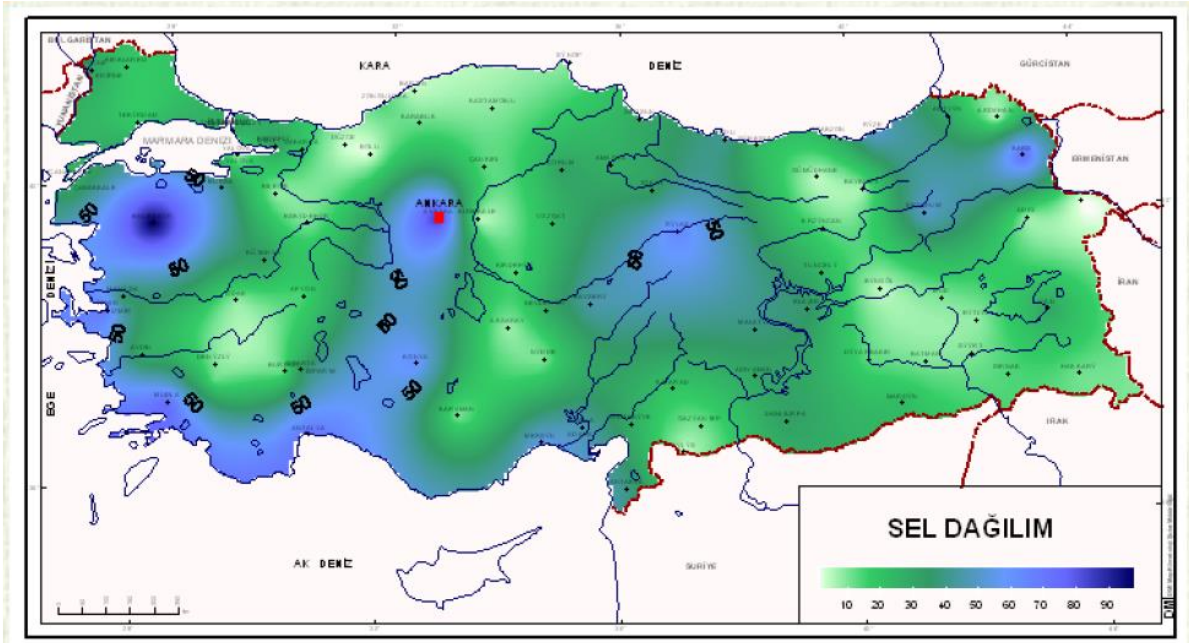


Figure 5. Flood Map by Spatial Distrubition

Flooding occurred in all provinces of Turkey (Figure 5). Total number of flood incidents are 4067 and 22157 people were affected by floods between 1944-2008 (Table 2). After earthquakes, floods are the most economically damaging natural disasters (Figure 6).

According to available data, floods cause approximately 100 million \$ of damages related to economical loss each year.

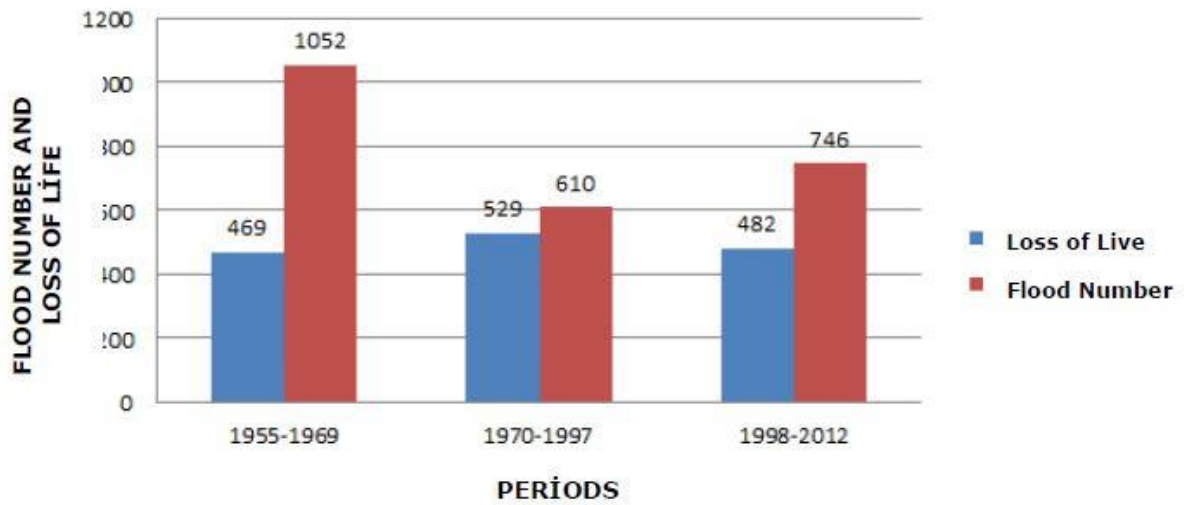


Figure 6. Number of Flood Events and Loss of Life During Periods of 1955-1969, 1970-1997, 1998-2012

Table 2. Number of disasters and disaster victims according to disaster type

Disaster Victims						
Disaster Type	Disaster Number	Effective Transfer	Additional Transfer	Ineffective Transfer	Transfer Cancellation	Number of Total Affected Disaster Victims
Landslide	13494	65759	2622	3998	13034	59345
Rock-Fall	2956	19699	935	2442	3654	19422
Flood	4067	29020	506	1197	8566	22157
Earthquake	5318	157794	45	637	235	158241
Other Disasters	1175	11309	8	85	2165	9237
Avalanche	731	4409	181	336	542	4384
Multiple Disasters	2024	17221	629	838	6478	12210
Unclassified Disasters	42	0	0	0	0	0
TOTAL	29.807	305.211	4.926	9.533	34.674	284.996

According to table, earthquakes, landslides, and floods are disasters causing the most damage in Turkey. This data summarizes the overall disaster profile of Turkey for the past 50 years and consists of evaluations of the database of AFAD (Disaster and Emergency Management Authority).

Table 3. Search and Rescue Operations in 2012 by Provincial Directorates

Item No	Type of Incident Responded	Number of Incidents	Personnel Assigned	Rescued Alive	Reached Dead
1	Traffic Accident	172	806	443	89
2	Drowning	55	283	8	58
3	Lost	54	308	35	20
4	Flood-Flash Flood	21	274	318	10
5	Land Slide	10	70	3	5
6	CBRN	4	19		
7	Earthquake	3	20		
8	Fire	7	52	45	
9	Stranded	42	163	48	5
10	Avalanche	1	7		1
11	Accident	12	62	14	4
12	Attempted Suicide	3	20	3	
TOTAL		384	2.084	917	192

At present times in Turkey, there is a wide range of actors that are involved in the flood management sector, be it before, during or after the flood events. Their fields of competencies may include, protection works and river management, land use policies, civil protection, disaster and emergency response, land management, risk management, hydrometeorology...

- Directorate General of State Hydraulic Works (DSİ),
- Directorate General of Water Management (SYGM),
- Directorate General of State Meteorological Service (MGM),
- Metropolitan Municipalities,
- Local Authorities(governorships and municipalities),
- Disaster and Emergency Management Authority (AFAD)

2.1.3 Landslide

As is known, excessive casualties and damages are experienced in many parts of the world due to disasters. Extremely high economic losses are suffered. Furthermore, besides these direct losses, loss of markets, production, and labor, unemployment, and environmental damage should be taken into consideration. Thus, it is evident that the actual losses are far beyond the estimated ones. It is a fact that Turkey has all conditions required for natural disasters due to its geologic, geomorphologic, and climate characteristics.

Furthermore, unplanned urbanization and uncontrolled population increase are important factors triggering the increase of losses. Many citizens have lost their lives, and immense economic losses have been incurred to date in Turkey due to natural disasters. Table 5 provides an assessment demonstrating this.

Table 4. Number of disasters and disaster victims according to disaster type (Gökçe et al., 2008).

Disaster Type	Disaster Number	Disaster Victims				Number of Total Affected Disaster Victims
		Effective Transfer	Additional Transfer	Ineffective Transfer	Transfer Cancellation	
Landslide	13.494	65.759	2.622	3.998	13.034	59.345
Rock-Fall	2.956	19.699	935	2.442	3.654	19.422
Flood	4.067	29.020	506	1.197	8.566	22.157
Earthquake	5.318	157.794	45	637	235	158.241
Other Disasters	1.175	11.309	8	85	2.165	9.237
Avalanche	731	4.409	181	336	542	4384
Multiple Disasters	2.024	17.221	629	838	6.478	12.210
Unclassified Disasters	42	0	0	0	0	0
Total	298.07	305.211	4.926	9.533	3.4674	284.996

Earthquakes, landslides, and floods are disasters causing the most damage in Turkey (Table 4). This data summarizes the overall disaster profile of Turkey for the past 50 years and consists of evaluations of the database of AFAD (Disaster and Emergency Management Presidency), furthermore, when the distribution of disaster types affecting settlements (province, district, township, and village) based on the said database is examined (Table 6), earthquakes, floods, and landslides once again appear to be the disaster types causing the most damage.

Table 5. Number of settlements affected by disasters according to disaster type (Gökçe et al., 2008).

Disaster Type	Number of Settlements Experiencing a Disaster	Rate in the Total Number of Settlements
Landslide	5472	15.31
Rock-Fall	1703	4.76
Flood	2924	8.18
Earthquake	3942	11.03
Other	992	2.78
Avalanche	605	1.69

When Table 4 and Table 5 are evaluated together, even though rock-falls have been dealt with separately in these tables, if rock-falls are fundamentally considered to be included under landslide types and mass movements, it can be said that landslides are the disaster type having the most damaging effect for Turkey.

Considering geological and geomorphologic properties, the Black Sea Region, in particular, as well as the Eastern Anatolian and Central Anatolian Regions include areas where landslides frequently occur in Turkey. In the study carried out by Gökçe et al. (2008) analyzing the spatial and statistical dispersion of disasters, 13494 of disasters are recorded to be landslides and 2956 are recorded to be rock-fall in the disaster data inventory among disasters occurring in Turkey between 1950 and 2008. The total number of disaster victims affected is given as 78,767 for the abovementioned two types of natural disasters (Gökçe et al., 2008). Another concern emphasized in the mentioned study is the observation of a landslide incident in 5472 settlements (% 15.31) out of 35741 kept in the concerned database (province, district, township, municipality and villages). This rate is 1703 (% 4.76) for rock-falls; the number of incidents and locational distribution of landslide and rock-falls according to provinces have been presented in Figure 7, Figure 8, Figure 9 and Figure 10.

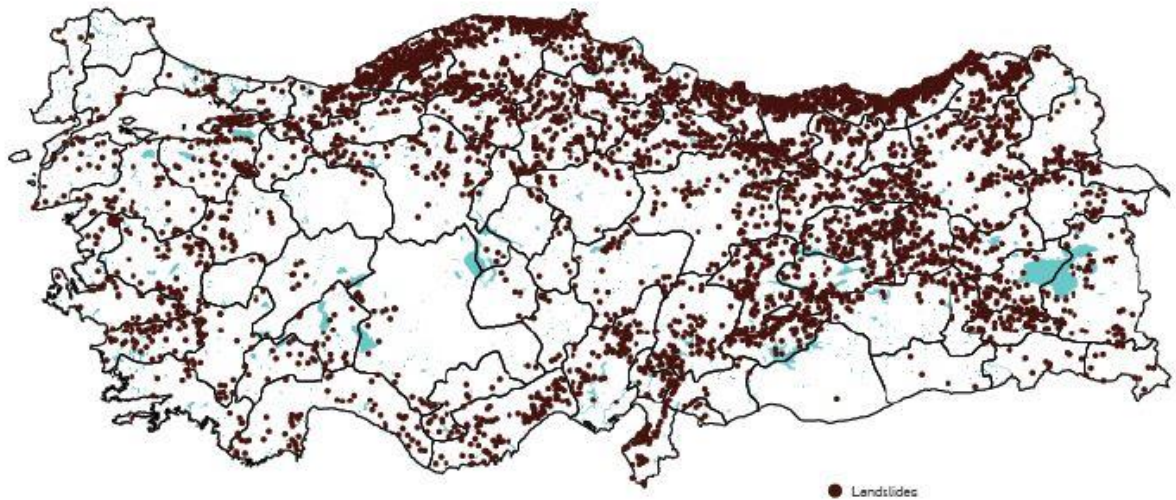


Figure 7. Locational distribution of landslides in Turkey between 1950 and 2008 (Gökçe et al., 2008).

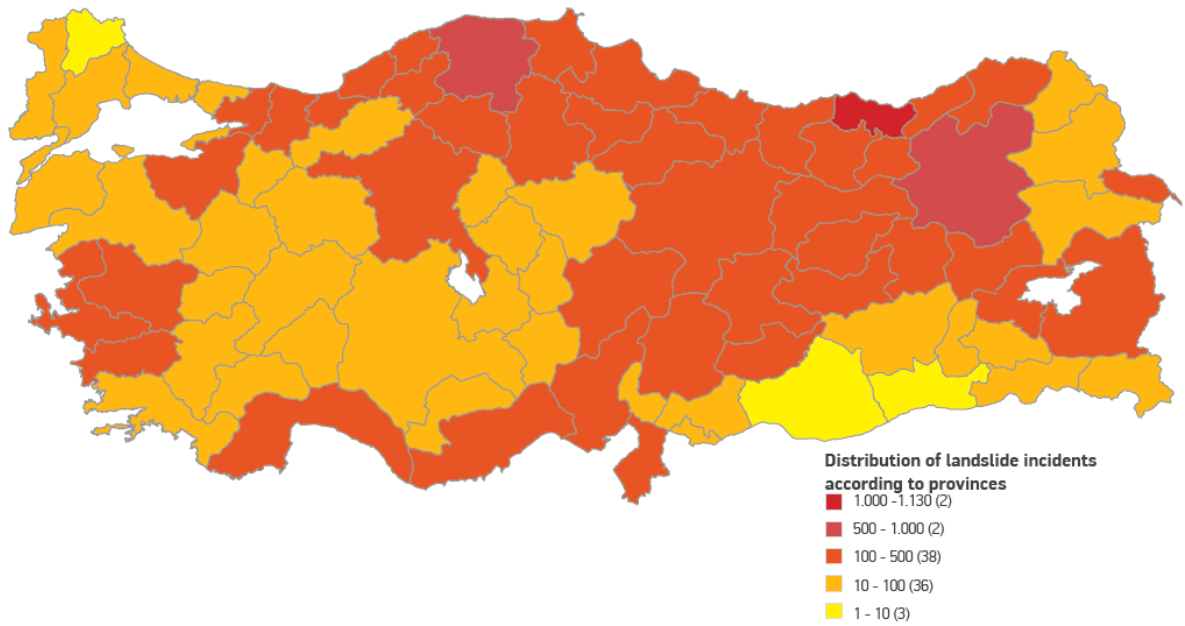


Figure 8. Distribution of the number of landslide incidents occurring in Turkey between 1950 and 2008 as to the provinces (Gökçe et al., 2008).

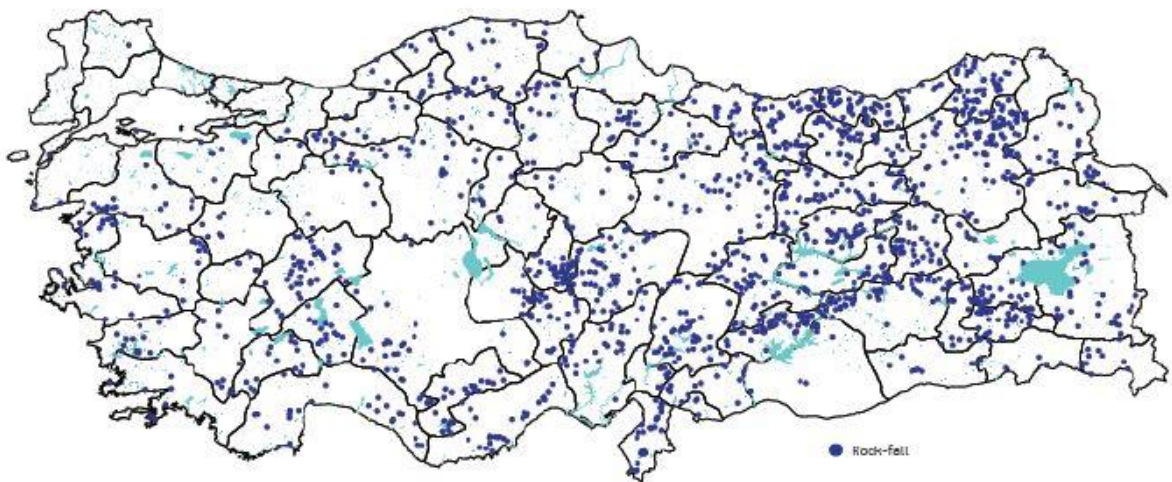


Figure 9. Locational distribution of rock-falls occurring in Turkey between 1950 and 2008 (Gökçe et al., 2008).

2.1.3 Forest Fires

The Turkey National Progress report on the implementation of the Hyogo Framework for Action (2013-2015) indicates: “Forest Fire Early Warning System and Fire Management System” has been established by the General Directorate of Forestry under the Ministry of Forest and Water Affairs in order to prevent forest fires. The primary element of extinguishing forest fires is early detection and early response. Notices concerning the forest fires are collected through the 775 Forest Fire Observation Tower personnel, who are on duty 24 hours during the summer; Early Warning and Observation System (OYEUS) that is carried out by TÜBİTAK and Bilkent University and the calls that citizens make to the 177 Free Forest Fire Detection line.

2.2 Recent Major Disaster

Turkey is prone to three main types of natural disaster: earthquakes, floods and landslides. The majority of the population (72 %) live in seismically active areas (Figure 11) and earthquakes have caused two-thirds of total disaster losses over the last century, with 16 % due to landslides and 15 % due to floods.

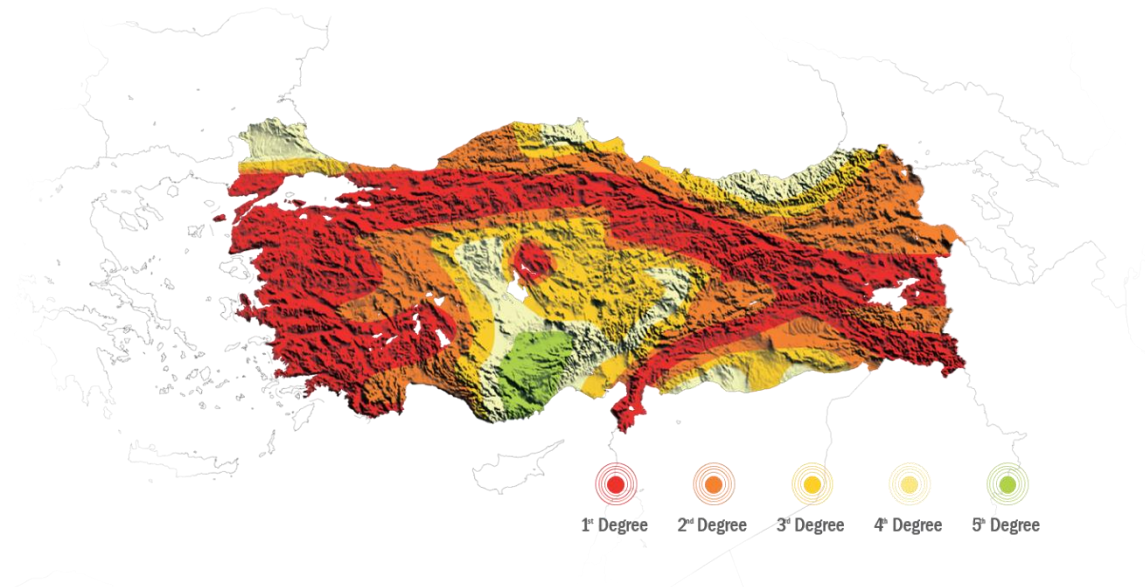


Figure 11. Seismic Zones in Turkey

The Major disasters occurred in Turkey and their economic impacts were shown in Figure 12.

Disaster	Date	Cost (US\$)
Earthquake (Marmara)	1999	20,000,000,000
Earthquake (Van)	2011	5,000,000,000
Flood	1998	1,000,000,000
Earthquake (Düzce)	1999	1,000,000,000
Earthquake (Erzincan)	1992	750,000,000
Flood	2009	550,000,000
Earthquake (Adana-Ceyhan)	1998	550,000,000
Flood	2006	317,000,000
Earthquake (Afyon-Dinar)	1995	205,800,000
Earthquake (Kütahya-Simav)	2011	155,000,000
Flood	1990	150,000,000
Earthquake (Bingöl)	2003	135,000,000

Disaster	Date	Killed (no. of people)
Earthquake (Marmara)	1999	17,127
Earthquake (Erzurum/Kars)	1983	1,346
Earthquake (Düzce)	1999	845
Earthquake (Erzincan)	1992	653
Earthquake (Van)	2011	606
Mass mov. dry	1992	261
Earthquake (Bingöl)	2003	177
Earthquake (Adana-Ceyhan)	1998	145
Mass mov. wet	1993	135
Earthquake (Afyon-Dinar)	1995	94
Flood	1980	75

Figure 12. Disaster Ranking in Terms of Economic Damages and Killed People.

Earthquake (1999) - the 7.4 magnitude Marmara Sea region earthquake on August 17, 1999 that centered around Golcuk in the province of Kocaeli was really a succession of several major earthquakes, each triggering the next one. The length of the observable faulting was 130 km, and cut a narrow swath of destruction through Yalova, Karamursel, Golcuk,

Izmit (capital of Kocaeli province), Adapazari and Duzce within Bolu. The number of certified deaths in this event are 20,000, with 50,000 injuries. Close to 350,000 residential and commercial units were destroyed. This calamity caused widespread destruction also to major transportation routes, sea front facilities, factories, refineries and the many industrial units in Kocaeli that accounts for 35 percent of Turkey's GDP. Sakarya was similarly impacted. Though it is improbable according to conventional seismological circumstances, a magnitude-7.2 earthquake hit Duzce on November 12, 1999 (86 days after the first shock) that caused further destruction in that area.

Earthquake (2011) - the 2011 Van earthquakes occurred in eastern Turkey near the city of Van. The first earthquake happened on 23 October at 13:41 local time. The shock had a Mw magnitude of 7.1 and a maximum Mercalli intensity of VIII (Severe). It occurred at a shallow depth, causing heavy shaking across much of eastern Turkey and lighter tremors across neighboring parts of the South Caucasus and Levant. The earthquake killed 604 and injured 4,152 people. At least 11,232 buildings sustained damage in the region, 6,017 of which were found to be uninhabitable. The uninhabitable homes left as much as 8,321 households with an average household population of around 7.6 homeless in the province; this could mean that at least around 60,000 people were left homeless. The other 5,215 have been damaged but are habitable. A separate earthquake within the same earthquake system happened on 9 November at 21:23 local time (19:23 UTC). 40 people were killed and 260 people were injured in the 9 November earthquake.

Flood (1998) - in 1998, in May and August there were floods in the Black Sea region and some 2.2 million persons over an area of 37,000 sq. km were affected. Although less than 100 people lost their lives.

Earthquake (1992) - on 13 March, the 1992 Erzincan earthquake struck eastern Turkey with a Mw magnitude of 6.7 and a maximum Mercalli intensity of VIII (Severe). Originating on the North Anatolian Fault, it rocked the country, leaving at least 498 people dead, roughly 2,000 injured.

Earthquake (1998) - on June 27, 1998, a major earthquake with a magnitude of 6.2 occurred near Ceyhan, in the Mediterranean region. This earthquake was felt over many urban centers in the area, and caused 145 deaths and either destroyed or seriously damaged 25,000 residential or commercial units.

3. Turkey Disaster Management System

3.1 Institutional and Legal Framework

3.1.1 National Policy and Legal Framework

Turkey is located on a high-risk geography that is heavily affected from disasters due to its geological structure, topography and climactic characteristics. Turkey has learned some bitter lessons from the disasters it has experienced, and has consequently abandoned the crisis management mentality and taken necessary steps to prioritize risk management in disaster management.

In this scope, promoting a culture of risk prevention and mitigation in the society, accelerating training activities, using modern technologies and communication facilities, expanding cooperation at the local, regional and international level and playing a leading role in these platforms are among Turkey priority objectives. We have to make Turkey strategic policies and prepare for the unexpected based on the foresight that the global climate change and instability.

Because of the lessons learned from management and coordination problems in particular from the earthquake of 1999 and various subsequent disasters, the former post-disaster central-to-local crisis management mentality was replaced with pre-disaster mitigation activities and local-to-central risk management. In this framework, with the founding law passed in 2009, AFAD was established at the central level, with Disaster and Emergency Directorates attached to Governorates under Special Provincial Administrations established at the local level. Starting to work on its strategic plan following its founding, AFAD has extensively revised the draft strategy document in consideration of changes in higher experiences from the Van Earthquake and studies on social disorders taking place in various countries in the recent years. AFAD has identified its vision as:

“Being a leading and coordinating organization which offers a model that can be taken at the international level as being, based on sustainable development, riskcentered, efficient, effective and performing reliable service in the studies related to disaster and emergencies.” and its mission as “Building a disaster resilient society.”

AFAD identified its goals parallel to its vision and mission as follows:

- Being a constantly developing and learning organization,
- Establishing a risk-centered integrated disaster management system,
- Generalizing disaster management standards, • Launching out an educational campaign for disaster preparedness,
- Being a leading organization in the international arena.

The first of these five goals, identified on the basis of risk management, seeks to ensure institutionalization and information management, as we believe that “AFAD should first effectively manage itself in order to effectively manage disasters.” The second goal incorporates all the steps contained in an integrated disaster management cycle, from establishment of support systems to execution of necessary activities, and seeks to spread this system nationwide. The third goal reflects the necessity to introduce standardization into disaster management so as to ensure effective, efficient and economic utilization of all resources with relevant actors acting within specific rules in full cooperation. One of the most important pillars of integrated disaster management is society’s preparedness for hazards and risks. An education campaign will be launched to prepare Turkey for disasters, which is planned under objective four. The final objective of the plan is to strengthen Turkey international relations, increase visibility and become a leading country in the international arena in parallel with Turkey vision.

The values and principles of Turkey are the most important factors that affect the way of doing business of organization. As a result of the studies AFAD’s values and principles determined as follows:

Values: Dedicated, human-focused, reliable, sensitive and self-confident Principles: Openness and transparency, participation and sharing, accountability, effectiveness and efficiency, consistency and integration

With its strategic plan, AFAD aims to:

- Place its decisions and actions in a strategic management framework,
- Plan development and change in its services,
- Create an organizational culture and ensure that its employees take ownership of that culture,
- Prepare its budget in a way that will enable it to realize the goals set in its strategic plan, and base its resource allocations on predetermined priorities, and
- Fulfil its accountability obligation towards the public.

AFAD has structured its strategic plan to confidently carry Turkey to the year 2023 with all its axes, and has established the necessary infrastructure to put it into practice with speed.

RELATION WITH HIGHER LEVEL POLICY DOCUMENTS

The main higher-level policy documents used when developing the plan are as follows:

- HYOGO Framework for Action Plan (2005-2015)
- NEW: Sendai Framework for Disaster Risk Reduction (2015-2030)
- Ninth Development Plan (10th development plan)
- Medium Term Programme (2013 – 2015)
- 60th and 61th Government Programmes
- 2012 Annual Programme
- KENTGES
- Rural Development Plan
- National Climate Change Strategy and Action Plan

Turkey is preparing National Framework for Disaster Management of Turkey with an integrated approach. The Strategy covers all the phases and all the actors (Public Institutions, NGO's, Academia, Private Sectors and Media) of the disaster management cycle and identifies the policies and actions that can be implemented over the long run to reduce risk and future losses. It concentrates on the prevention and mitigation phases in order to reduce possible future risks and losses and is the guideline to manage disaster and support sustainable development. It targets building disaster resilient community.

National Strategy for Disaster Management of Turkey is a document that makes all institutions and organizations in the country, aware of national disaster management understanding, concepts and strategic objectives; ensure the development of a shared understanding and modality about disaster preparedness; and lay down a framework about what must be done and what must be provided to secure efficient disaster management.

Within the framework of Turkey disaster management framework is taken into consideration as a governance model through which:

- Disaster management is dealt with in a multi-stakeholder structure that assigns important responsibilities to the central government, is based on local governance and allows the effective participation of the academia, private sector, civil society institutions and the community.
- All systems, processes and products related to disaster management are defined in the legislation and are established based on the technical regulations (standardization, accreditation/designation and certification).
- Implementations are carried out with the utilization of a strong and efficient infrastructure and capacity.

The basic policy and principles of disaster management in Turkey are consist of Risk Focusing, Participation, Local governance, Integrity with Sustainable Development, Continuous Development, Flexibility, Give Priority for Distinctive Systems and Domestic

Technologies. These policies are backed by principles of transparency, accountability, efficiency, effectiveness, scientific, environmental awareness, sustainability, availability, flexibility, comprehensiveness, continuity and impartiality, sensibility for diversity and harmony with ecosystem.

3.1.2 National Platform for Disaster Risk Reduction

The aims of the Platform are to; provide public awareness against disasters, ensure coordination and cooperation in order to maintain disaster related issues sustainable, assessment of needs, monitoring and evaluation of implementations in order to contribute to integration of disaster risk reduction policies into sustainable development plans and policies at all levels. The platform is limited by local governments to, comply with the objectives of the record related to public institutions and organizations, professional associations, private sector organizations, non-governmental organizations, with representatives of written and Visual Media. However, the reduction of disaster risks internationally operating specialist institutions and organizations may be invited to work on the platform. There are a total of 53 members. Turkish Disaster Risk Reduction National Platform was established by the 2011/1320 numbered and 17.01.2011 dated Cabinet Decision and published on the 27844 numbered, 12.02.2011 dated formal newspaper.

National Platform is a coordination and advisory group of several actors from the disaster community. The National Platform is formed by the decision of Cabinet and chaired and managed by AFAD. Members of the platform, as of March 2011 are as follows:

Governmental Organizations:

1. Prime Ministry (was abolished), 2. Chief of General Staff, 3. Ministry of Interior 4. Ministry of Education 5. Ministry of Public Works and Settlement 6. Ministry of Health 7. Ministry of Transportation 8. Ministry of Agriculture and Rural Affairs 9. Ministry of Energy and Natural Sources 10. Ministry of Environment and Forestry 11. Ministry of Culture and Tourism 12. The Council of Higher Education 13. Prime Ministry (was abolished), Undersecretary of Treasury (DASK) 14. Prime Ministry (was abolished), State Planning Organization 15. General Command of Mapping 16. Boğaziçi University, Kandilli Observatory and Earthquake Research Institute 17. The Scientific and Technological Research Council of Turkey

Non-Governmental Organizations and Professional Organizations:

1. Search and Rescue Association (AKUT) 2. Neighbourhood Disaster Support Group (MAG) 3. Environment Foundation of Turkey 4. GEA Search and Rescue Group 5.

Psychiatric Association of Turkey 6. Chamber of Geological Engineers 7. Chamber of Geophysical Engineers 8. Chamber of Civil Engineers

Universities:

1. Middle East Technical University 2. Istanbul Technical University 3. Karadeniz Technical University 4. Kocaeli University 5. Dicle University

Local Authorities:

1. Governorate of Istanbul 2. Governorate of Erzincan 3. Governorate of Kahramanmaraş 4. Governorate of Denizli 5. Governorate of Hatay 6. Governorate of Bingöl 7. Istanbul Metropolitan Municipality 8. Erzurum Metropolitan Municipality 9. Bursa Metropolitan Municipality 10. Municipality of Trabzon 11. Municipality of Giresun 12. Municipality of Manisa 13. Municipality of Afyonkarahisar 14. Turkish Union of Municipalities 15. Union of Governors

Private Sector:

1. Turkish Industrialists' and Businessmen's Association (TUSIAD) 2. The Union of Chambers and Commodity Exchanges of Turkey (TOBB) 3. Turkish Contractors Association (TMB)

Media:

1. Prime Ministry (was abolished), General Directorate of Press and Information 2. Turkish Association of Journalists 3. Turkish Radio and Television Cooperation (TRT) 4. Anadolu Agency

National Association:

1. Turkish Red Crescent

3.1.3 National DRM Legislations

The list of laws which are directly related to disaster risk management could be seen below.

- 1. Law No. 5902 on Organization and Functions of the Disaster and Emergency Management Authority (AFAD):** This law covers the matters of taking necessary measures for efficient country-wide execution of services related with disasters, emergencies and civil defence, making preparations prior to occurrence of incidents, mitigating the damage sustained, providing coordination among related institutions

and organizations which manage the responses during incidents and recovery works to be performed afterwards, and creating and implementing policies on these matters.

2. Law No. 7269 on Measures and Assistances to Be Put into Effect Regarding Disasters Affecting the Life of the General Public: Beside other regulations, this law also takes “possible disaster” term into consideration and covers the determination of “disaster exposed area” which obligate disaster risk reduction practices in the area.

3. Law No. 7126 on Civil Defense: Beside other regulations, this law contains regulations about civil defense planning, warning and alarm and civil defense educations which will evaluated with mitigation.

4. Law No. 5302 on Special Provincial Administrations: Special provincial administrations are appointed to make up disaster and emergency plan which must contain disaster risk reduction elements in their territory with this law.

5. Law No. 5216 on Metropolitan Municipalities: Metropolitan municipalities are appointed to make disaster and emergency plan up which must contain disaster risk reduction elements in their territory with this law. To demolish buildings which have disaster risk is also duty of metropolitan municipalities within this law. In addition, metropolitan municipalities are responsible from urban transformation within their territories.

6. Law No. 5393 on Municipalities: Municipalities are appointed to make disaster and emergency plan up which must contain disaster risk reduction elements in their territory with this law. To demolish buildings which have disaster risk is also duty of municipalities within this law. In addition, municipalities are responsible from urban transformation within their territories.

7. Law No. 5403 on Soil Preservation and Land Utilization: In order to reduce soil loses because of landslides, floods and winds, governorates are appointed to constitute soil protection projects according to this law.

8. Law No. 5363 on Agriculture Insurances: This law also covers assurance about drought, flood, typhoon, earthquake, landslide, fire, hail and freeze.

9. Law No. 2958 on Housing Development Administration (TOKİ): TOKİ is an important partner for urban transformation.

10. Law no. 5366 on Usage of Timeworn Historical and Cultural Real Property with Restoration and Protection: One of the main aim of this law is to protect historical and cultural real property from natural disasters.

11. Law No. 3194 on Land Development Planning: The law states its aim as achievement of 'appropriate formation of settlements and buildings. Due to this law, relevant ministry have right to make land development plans in the disaster affected area.

12. Law No. 3234 on Organization and Duties of the General Directorate of Forestry: Beside other regulations, this law contains regulations about protecting forests and ecosystem against disasters like fires, erosion, desertification, floods, avalanche and etc.

13. Law No. 3234 on Organization and Duties of the General Directorate of Meteorology (MGM): MGM has a duty to make research and development on meteorological natural disasters, hydrometeorology, sea and agricultural meteorology, climate, climate change and other related topics according to this law.

14. Law No. 6200 on Organization and Duties of the General Directorate of State Hydraulic Works (DSI): DSI has a duty to create facilities against floods according to this law.

15. Law No. 6831 on Forests: Ministry of Forestry and Water Affairs has duties to constitute projects on erosion, flood, avalanche and landslide mitigation in the forest areas.

16. Law No. 6305 on Catastrophe Insurance: The objective of this Law is to determine the procedures and principles for the compulsory earthquake insurance to cover the financial losses which may arise in buildings due to earthquakes and for the insurance and reinsurance coverages to be presented in order to cover the material and physical damages which may arise as a result of various disasters and risks which cannot be covered by insurance companies, or which bring about challenges with regards to offering coverage.

17. Law No. 6306 on Restructuring of Areas under Risk of Disasters: It aims to make cities and buildings resilient against disasters in Turkey. By means of this law, particularly Ministry of Environment and Urbanization, central administrations (Ministry of Interior and Housing Development Administration (TOKİ), local administrations (municipalities, special directorates), professional chambers, NGOs and the society are encouraged to cooperate in order to create disaster resilient buildings and cities.

18. Decree-law No. 644 on Organization and Functions of the Ministry of Environment and Urbanisation: Beside other regulations, this law also covers determination of rules related to make and approve of risk management and mitigation plans and to do, to get someone done or to approve research criteria about these plans.

19. Decree-law No. 655 on Legislative Decree on Organization and Duties of the Ministry of Transport, Maritime Affairs and Communication: One of the duties of the Ministry is “through utilizing space environment and technologies, making or having others make studies in order to protect human health and environment, to diminish damages of natural disasters by forecasting, to utilize natural resources and to develop the country”.

REGULATIONS

The list of other regulations which are directly related to disaster risk management could be seen below.

1. Regulation on Buildings to be constructed in Disaster Areas: The purpose of this regulation is to determine standards of constructions in disaster areas which are identified due to the Law no. 7269 on Measures and Assistances to Be Put into Effect Regarding Disasters Affecting the Life of the General Public.

2. Regulation on Specification for Buildings to be Built in Seismic Zones: The general principle of earthquake resistant design to this Specification is to prevent structural and non-structural elements of buildings from any damage in low-intensity earthquakes; to limit the damage in structural and non-structural elements to repairable levels in medium-intensity earthquakes, and to prevent the overall or partial collapse of buildings in high-intensity earthquakes in order to prevent the loss of life.

3. Regulation on Disaster and Emergency Expenditures: Due to Law no. 5902, there is a fund which is allocated to disaster management and it could be used in a fast and efficient way. This regulations is determining the rules for this fund. One of the spending item according to this regulation is making studies, etudes, projects to prevent losses in any kind of disasters.

4. Regulation on Duties regarding Chemical, Biological, Radiological and Nuclear Threats: The main purpose of this regulation is to determine duties and responsibilities of

public and private organizations and other instructions', before, during and after a CBRN incident.

5. Regulation on Disaster and Emergency Response Services: The purpose of this Regulation is to plan all power and resources which may require in case of response for disaster and emergencies, to provide the arrival of those power and resources to the event area rapid and efficiently, to determine the duties and responsibilities of the stakeholders responsible for the coordination of these services.

6. Regulation on Implementation of Law on Restructuring of Areas under Risk of Disasters: The purpose of this Regulation is to set out the principles and the procedures to determine the risky structure and risky area, pull the risky structure down, make build back better codes and the plans in accordance with the Law no 6306.

7. Regulation on Emergencies in the Workplaces: The purpose of this Regulation is to set out the procedure and principles of preparing emergency plans regarding the working places, determining the studies that include prevention, protection evacuation, firefighting, first aid etc. and the staff who is charged with these issues.

8. Regulation on Infrastructure for Disasters: The purpose of this Regulation is to set out the procedure and principles to create disaster resilient infrastructures like water pipelines, sanitation and waste water purification facilities.

9. Regulation on Road Construction for Disasters: The purpose of this Regulation is to set out the procedure and principles to create disaster resilient roads.

10. Regulation on Environment Planning: Due to this regulation, land planning has to be made according to the ecologic, geologic and hydrological risks.

11. Regulation on the Operation Principles of Natural Disaster Insurance Institution: The purpose of this Regulation is to set out the operation principles and procedures of Turkish Catastrophe Insurance Pool (TCIP) which is established in order to provide the compulsory earthquake insurance and the other natural disaster insurance coverage.

12. Principles on Establishment, Duties and Working Procedures of Turkish Disaster Risk Reduction Platform: The purpose of this Principle is to establish National Disaster Risk

Reduction Platform to enhance the awareness for disaster in society and sustainability for risk reduction studies, determine the requirements of risk reduction in accordance with all types of plan, policy and programs, contribute for monitoring evaluating the practices and set the duty and working principles of the Platform.

13. Regulation on Expenditures of Metropolitan Municipalities and Special Provincial Administrations for Disaster and Emergency Management and Civil Defence from Investment Budget of Their Own: Due to the Law no 5902, metropolitan municipalities and special provincial administrations have to spare specified ration of their budget for disaster risk reduction activities. Main purpose of this regulation is to determine rules of this issue.

14. Regulation on Protection of the Buildings against Fires: The purpose of this regulation is to identify the procedure and principles of organization, training, audit and precaution issues before and during fire in order to minimize fires, reduce loss of life and property and extinguish fires.

As mentioned above these laws and regulations could be related directly with disaster risk reduction.

3.1.4 Cooperation

Turkey National Platform for DRR has been established and carrying out its activities within AFAD includes 53 stakeholders from public institutions, universities, local administrations, NGOs, professional associations, media and platforms and the private sector. National Platform in line with the Hyogo Framework for Action has duties for presentation of views on reducing disaster risk to public opinion, raising public awareness for the disaster, consistent effort for cooperation and coordination to reduce disaster risk. The Platform has been examined in accordance with the UN's assessment and recommendations regarding the structure and functioning of national platforms. Those works have been carried out with the participatory scope, and parallel to this understanding, a meeting was held with broad participation in March 2014. The members of the structure and the number of members of the National Platform in this context, has been updated and improved. Regulation of National Platform is revised in line with UN recommendations. In addition, a workshop was organized as part of the preparatory works of "National Progress Report (2013- 2015)" with the participation of Platform Members. Activities to expand the platform members and ensure representation of all sectors have been continuing and National Platform is developed with the evaluation of the shortcomings in the reports for more effective platform operation prepared by the UN.

For further information:

[Turkey National Progress report on the implementation of the Hyogo Framework for Action \(2013-2015\)](#)

“Improving International Cooperation Infrastructure for Development” is programmed in the Tenth Development Plan. Within the framework of this project, whose coordination is provided by AFAD, the implementation of the Program is planned for 2015-2017 period. Public agencies and institutions, universities, professional chambers are the domestic stakeholders and other countries are included as foreign stakeholders of the Project. The goal of the Project, with a budget of 9.400.000 TL, is to share Turkey’s knowledge, experience and opportunities in the field of development with other stakeholder countries.

3.1.5 Implementation

Turkey conducts the coordination of the integrated disaster management system under the Prime Ministry (was abolished) from a sole source. Integrated disaster and emergency plans, Turkey Disaster Management Framework, preparedness, response, mitigation, rehabilitation, reconstruction plans and development and sectorial plans are prepared and implemented by means of modular system. Turkey has opened up a separate heading to disaster management issue in Tenth Development Plan and has emphasized the disaster risks and disaster reduction policies in an effective way. The legal infrastructure is available for the usage of the data related with vulnerable and disadvantaged groups such as women, children, elderly, disabled and minorities in order to integrate disaster risk reduction policies within economic and social life.

The aim of the National Earthquake Strategy and Action Plan is to minimize the possible physical, economical, social, environmental and political damage and losses or effects of earthquakes and to create living areas that are resistant, prepared against earthquakes.

National Earthquake Strategy and Action Plan (UDSEP-2023) which was prepared at the national level will provide the fulfilment of short, medium, and long term actions. Responsible and Associated organizations are determined. Three principal thematic groups have shaped the objectives, strategies and actions of UDSEP-2023 as given in the following;

- Learning about earthquakes,
- Earthquake safe settlement and construction,
- Coping with the consequences of earthquakes.

The periods for realization of the Action Plan tasks have been based on the framework of **Short Term (2012-2013), Medium Term (2012-2017) and Long Term (2012-2023)** durations.

The types of action have been considered under four principal headings as;

- Cooperation and Coordination (CC),
- Legislation Revision (LR),
- Institutional Structuring (IS),
- Capacity Enhancement (CE)

In addition, economic and social development is guided by Five-Year Development Plans, medium-term programs and annual programs at national scale. Though there were provisions for disaster management in development plans in the past, there did not exist separate subtitle for it. For the first time, disaster management was given place as a separate title in [Tenth Development Plan \(2014-2018\)](#), in parallel with the international developments regarding disasters and strategic goals and action priorities of Hyogo Framework for Action. In the Tenth Development Plan, considering disaster risk and mitigations in macroeconomic, sectorial and spatial planning processes; increasing the level of social resilience and consciousness against disasters and constructing durable and safe settlements were stated as main goals. The goals stated in the Development Plan as constructing resilient societies and settlements could also be found in common strategies that are [Integrated Urban Development Strategy and Action Plan – 2023](#) and National Earthquake Strategy and Action Plan – 2023. Work in order to achieve the goals in both action plans such as doing analysis of risk and emergency, determining evacuation roads, constructing shelter areas, strengthening the infrastructure for emergency communication and making inventory of buildings is still continuing. In order to fulfil its own liabilities in the scope of United Nations Framework Convention on Climate Change, [Turkey's National Climate Change Action Plan 2011-2023](#) was prepared by the Ministry of Environment and Urbanization (MoEU). Also, [Upper Catchment Flood Control Action Plan \(2013-2017\)](#) was prepared by Ministry of Forest and Water Affairs.

In Turkey for developing an integrated disaster system to reduce disaster risks is stated as a goal in the [Strategic Plan of AFAD for the 2013-2017](#) periods. AFAD, having a vision of being a leading and coordinating organization offering a model that can be taken at an international level, has an understanding based on sustainable development, risk-centered, efficient, effective and reliable service in its efforts related to disaster and emergencies.

3.1.6 Evaluation

All studies and national plans have been evaluated and monitoring by Ministry of Development in Turkey.

UDSEP's realization process, shall be monitored by UDSEP MONITORING AND EVALUATION COMMISSION, which will be formed by Disaster and Emergency Management Authority (AFAD) Earthquake Advisory Board. At the same time, this group will be in charge of coordination of work with AFAD Earthquake Department, holding meetings with responsible and related institutes and providing necessary guidance, monitoring principles and strategies of UDSEP, and, if necessary, proposing changes in strategies or creating new strategies. AFAD is authorized to issue directives, guidelines or regulations in order to manage UDSEP-2023 nation-wide effectively.

For the evaluation of AFAD Strategic Plan: Monitoring means systematic following and reporting of the implementation of the strategic plan. Evaluation is assessment of implementation outcomes by comparing them against goals and objectives and analysing the consistency and relevance of said goals and objectives. Actions that should be taken to achieve AFAD's goals and objectives, and responsible parties, resources and performance indicators are defined in the action plan. An effective monitoring and evaluation system will be built in cooperation with Departments, so as to monitor realization levels of AFAD goals and take effective measures in time. In addition, IT systems (for electronic monitoring) will also be incorporated into this system. However, monitoring and evaluation will basically be carried out in consideration of performance criteria. On the other hand, annual Performance Programmes will be prepared to increase the effectiveness of monitoring. Monitoring of implementation will start as soon as the AFAD Strategic Plan is approved by the Presidency and put into effect. With the participation of responsible and coordinating Departments associated with the objectives included in the strategic plan, the Department of Strategy Development will prepare a monitoring plan and directive within 3 months following the effective date of the plan, and will notify the responsibilities to relevant people. The basis of the monitoring plan will be the objective action tables prepared and published when developing the strategic plan. In addition, said directive will also explain the computing methods for performance indicators. In parallel, basic monitoring systematic will be built on indicating what all the activities and in particular the expenditures by the Presidency correspond to in the strategic plan. Evaluation is assessment of implementation outcomes by comparing them against goals and analysing the consistency and relevance of said goals and objectives. This is essentially done through annual activity reports prepared by the Department of Strategy Development. However, evaluation systematics will be carried out in frequencies parallel to monitoring.

3.1.7 International Lessons Learned

The foundation of the Disaster Management System in Turkey rests on the lessons learned from a major earthquake of 1939 in Erzincan. The regulations have been developed by various changes which have frequently been made after major disasters.

The fundamental legislative changes have been made after the major earthquakes of 1999 in Marmara Region. These regulations were prepared as statutory decrees so they could enter into force immediately by a general legal basis and they play an important role in development of legal space of disaster management.

After Syrian crisis which broke out in 2011 to defray current needs in the management of immigrants and to keep up with the latest developments Law on Foreigners and International Protection was enacted in 04/04/2013. As a result of the legislative amendments carried out in accordance with international and national legislations, the Regulation on Temporary Protection entered into force in 22/10/2014.

After the lessons learned from Van Earthquake 2011, as a part of legal space of disaster response management, the studies for Regulation of National Response Services had been out on fast track and the Regulation entered into force in 2013.

U.S. Chemical Safety Board (CSB) conducts root cause investigations of chemical accidents at fixed industrial facilities. After the two major mining accidents happened in **Soma and Ermenek Regions of Turkey**, the ILO convention number 176 (Safety and Health in Mines Convention) accepted by government. In addition, some changes are made in national regulations in order to improve occupational health and safety in mining sector.

3.2 Responsibilities and Capacities for DRM

Disaster management has been established at two levels: locally and nationally. There is no regional level disaster management unit. However, according to AFAD Search and Rescue Association and Regulations, 11 regional rescue units were created. These units showing regional activities are included in the provincial disaster response planning. In addition, disasters and regional logistics warehouse were built 22 AFAD for emergencies. Established to serve the logistics warehouse capacity at the regional level are shown in local level planning (Figure 13).

Due to the lack of regional structure of the organization AFAD, regional plans prepared are made. However, regional natural disaster and prepared by different agencies with relevant policy where the actions are regional plans.

- Development Agency and Regional Plans
- Watershed Protection and Action Planning studies
- Developing the capacity to implement the Floods Directive work

- Upper Basin Flood Control Action Plan (2013-2017)
- Territorial Plans

However, due to legislative amendment to a restructuring at the regional level, it is not clear coordination and cooperation between the institutions.

It targets the development plan prepared by the Regional Development Agencies are prepared with timeframes, policies and priorities.

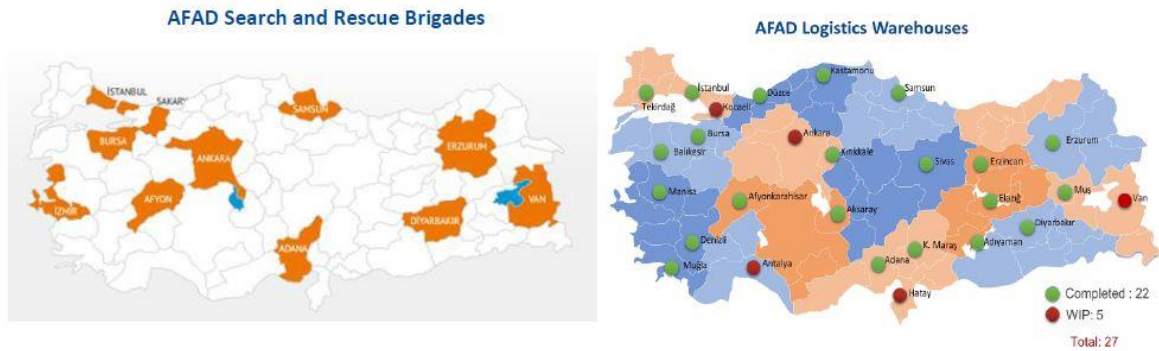


Figure 13. AFAD Search Rescue Brigades and Logistics Warehouses

At the local level as a priority intervention in disaster and emergency situations is responsible for the execution of the activities of the Governor's office. The local-level service group operational plans are prepared and the responsibility is assigned according to TAMP. All activities are coordinated by provincial disaster and emergency management centers in case of disaster or emergency.

Provincial disaster and emergency centers, working on a 7/24 basis. It provides coordination on behalf of the governor in disaster and emergency situations. All activities that are carried out at local level reported to Mol Disaster and Emergency Management Center. In cases when there is insufficient provincial resources is demanded from the Mol's Disaster and Emergency Management Center.

3.3. International Cooperations

3.3.1 Scientific Development

AFAD is actively attending the European Forum for Disaster Risk Reduction (EFDRR) and Disaster Risk Reduction Global Platform meetings within the scope of operations that are being carried out with UNISDR as the organization responsible for the application of the "Hyogo Framework for Action: 2005-2015 (HFA)" that had been accepted by the UN member countries in 2005. Through the "Turkey HFA Progress Monitoring and Assessment Reports" that are regularly submitted to UNISDR every 2 years, the progress that is achieved in the

disaster risk reduction work in Turkey is shared with the world public. In addition, within the framework of active cooperation with UNISDR “Southeastern Europe Disaster Risk Mitigation and Adaptation Programme (SEEDRMAP)”, “Building resilience to disasters in the Western Balkans and Turkey”, “Building Disaster Resilient Cities Project” and “School Safety Global Initiative Project” are carried out.

As the UNHCR is responsible for coordinating and executing international activities aimed at resolving refugee problems and protecting refugees throughout the world, Emergency Communication and Image Transmission Vehicles Project, Emergency Mobile Coordination Vehicles Project, Providing Psycho-Social Support for Syrians Project, Worker Aid for the Personnel in the Camps Project (1 and 2) and Visionary Leadership, Camp Management and Coordination Training Project, Emergency Mobile Healthcare Units Project, Prosthesis and Orthotics Production for Disabled Syrian Citizens Project are being carried out through the cooperation of AFAD and UNHCR.

AFAD is continuing the work towards further strengthening and developing the regional cooperation with Disaster Preparedness and Prevention Initiative of South Eastern Europe (DPPI SEE) in the field of preparing for disasters and combating them. Other international programs with which AFAD is connected are; Prevention, Preparedness and Response to Natural and Human Caused Disasters Program (EURO-MED-PPRD South – membership to which has ended in the year 2013), Natural and Technological Disaster Prevention Open Partial Agreement (EUR-OPA) and European Commission IPA (Instrument for Pre-Accession Assistance) program for candidate and potential candidate states.

Turkey is planning to start a capacity building program with IPA funds. Increasing the capacities and cooperation between AFAD and other institutions, raising the levels of consciousness and resilience of the society in Turkey and improving the disaster and emergency system are aimed with this program. AFAD is continuing its work to make the subject of disaster a priority during the IPA II Period, which lasts from 2014 to 2020. For this new period there are nine projects, suggested by AFAD, three of which are for the year 2014, within the scope of “Environment and Climate Change”. On the other hand the work of “Building resilience to disasters in the Western Balkans and Turkey” that is carried out by UNISDR and WMO according to Hyogo Framework for Action Plan with the aim of reducing vulnerability against natural disasters and increasing resilience against climate change in the countries which use IPA, continues.

Among other organizations that aim economic co-operation of countries within the context of reducing disaster risks that Turkey is a member of are: Economic Cooperation Organization (ECO), Organization of the Black Sea Economic Cooperation (BSEC), Joint Hellenic-Turkish Standby Disaster Response Unit Disasters (JHET-SDRU), Humanitarian

Aid Task Force Initiative (HOPEFOR), World Humanitarian Summit (WHS) and Civil-Military Emergency Planning Council for South Eastern Europe (CMEPC SEE).

Furthermore, Turkey is a member of UN Central Emergency Response Fund (CERF), OCHA Donor Support Group (ODSG), Disaster Preparedness and Prevention Initiative of South Eastern Europe (DPPI SEE), International Seismology Center (ISC), Europe Mediterranean Seismology Center (EMSC), Observatories and Research Facilities for European Seismology (ORFEUS) and Incorporated Research Institutions for Seismology (IRIS) and a determined amount of funds are transferred yearly by AFAD.

Turkey participates in European Forum for Disaster Risk Reduction (EFDRR) – Governance and Accountability in Disaster Risk Reduction Working Group, Organization of Black Sea Economic Cooperation (BSEC) “Emergency Cooperation” Working Group, Organization for Black Sea Economic Cooperation (BSEC) “Seismic Risk Specialists” Sub Working Group, European Seismology Commission and performs the roles of Authority of UNICEF Children Centered Humanitarian Aid Force and communication unit for the South Eastern Europe Disaster Risk Mitigation and Adaptation Program (SEEDRMAP).

3.3.2 Statistical Data

Turkish Disaster Data Bank (TABB), which aims to carry different electronic and published material in Turkey into a common platform, has started a test broadcast online at the address tabb.afad.gov.tr since the year 2013 by Disaster and Emergency Directorate (AFAD). Turkey National Disaster Archive System (TUAA) has been established and data of the disasters that have taken place in Turkey are aimed to be provided to the users of national disaster archive system (decision makers, administrators and researchers) in order to help their work and to raise public’s awareness about disaster risks.

The purpose of the Turkish Data Bank is to establish a web-based, user-friendly data bank for disasters open to disaster researchers and workers, with an infrastructure that ensures its benefit well into the future. The data bank will bring together the correct information and current work being undertaken regarding natural disasters experienced in our country, in particular, earthquakes. The latest technology and related information have been followed, and both national and international example applications have been taken into account in the realization of this purpose.

As a decision support system; TABB is able to collect all the information about disasters (disaster date, location, deaths, houses, infrastructure etc.) in Turkey from 1923 to the present day. The Turkish Disaster Data Bank (TABB) consists of Analysis and Document Modules. The Analysis Module’s aim is to archive data obtained after a natural disaster; the statistical analysis, mapping, and reporting of this data. The Document Module’s aim is to easily reach universities, local government, state institutions and NGOs with information related to natural disasters from a single source .

On the other hand, Earthquake Data Centre of Turkey (TDVM) which started its work in the year 2013 and which was established in order to provide the data on earthquakes to users in an accurate, standardized and rapid manner provides the data on earthquakes on the website. (tdvm.afad.gov.tr)

Disaster Management and Decision Support System (AYDES) Incident Command, Recovery and Location Information System Project is being brought to life in order to establish decision making support system centered management model and the information system that is needed for effectively execute the processes related to Disaster and Emergency Management (planning, preparation, response and recovery) and to make them sustainable. AYDES, conforming to the scope of TAMP, is an integrated platform that enables the processes to be carried out effectively and quickly and was designed in such a way that the information related to the disasters can be reached by all the stakeholders (AFAD, related ministries and local administrations) through the AYDES network. The AYDES software is comprised of three main systems which are Event Command System, Location Based Information System and Recovery System. The work related to the project is scheduled to be completed in the year 2016. Turkish Land Registry and Cadastre Information System (TAKBİS) which provides the standardization of the proceedings related with land and cadastre and ensures their compliance with the regulations and on a digital platform is operated as an integrated information system based on Geographical Information System/Land Information System by the Ministry of Environment and Urbanization General Directorate of Land Registry and Cadastre. Database of the systems are updating according to recent events.

A total of 20 measurement stations within “Turkey’s National Sea Level Monitoring System (TUDES)” operated by General Command of Mapping and sea level data as to 7 of them (Iskenderun, Erdemli, Bozyazı, Bodrum, Gökçeada, Marmara Ereğlisi, Sinop) has been shared with institutions.

All kinds of meteorological data archived at the Meteorological Data Archive System (TUMAS) can be reached on the Internet.

The first step of DRM is developed seismological observation network in the country wide scale. In this context, AFAD is the official authority and responsible institution regarding the all earthquake studies in Turkey. Within this scope, AFAD-TDVM project started in 2011. Thanks to this project, it is aimed to be center where all real-time (or offline) data recorded at existent station that have been operated by AFAD (weak and strong motion), another universities and institutions in Turkey is collected, stored, archived and shared with all users. In AFAD-TDVM structure, it has been provided that integration of different kind of data, merging and sharing to all users by using internet standards, web service and various software. On the other hand, as a legally, AFAD has possessed authorization on this matter.

According to Turkish Parliamentary Law No:6525, All universities, local authorities and all institutions which have performed earthquake observations, transfer to their data to the AFAD as online and main information related to earthquake like magnitude and intensity have been announced to the public from only AFAD. Under favour of AFAD-TDVM, all seismic data that is coming from the different seismic network will merge and archive system will develop. Although such kind of centers are in America, England, Japan and Europe, in Middle East, Caucasus, Arabian Peninsula and Middle Asia there are no this type of center. Within this scope, AFAD-TDVM is planning to be international data center in collaboration with mentioned countries seismological centers. This transformation will provide to Turkey achieve its objective to be the leading country in this area.

3.3.3 Regional Cooperation

Regarding the regional cross-border cooperation and cooperation between countries, AFAD has provided collaboration with neighbouring countries Georgia, Hungary and Serbia Seismological Center. In this context; seismic data exchange is performed as mutually with mentioned countries. On the other hand, AFAD is the member of EMSC (European-Mediterranean Seismological Center), ORFEUS (Observatories and Research Facilities for European Seismology) and ISC (International Seismological Center) and AFAD continue the cooperation with aforementioned institutions in terms of both seismic data sharing and project based.

1. CERF-The United Nations Central Emergency Response Fund
2. DPPI SEE- Disaster Prevention and Preparedness Initiative for South Eastern Europe
3. ISC- International Seismological Center
4. EMSC- Central Seismology for Euro Mediterranean
5. ORFEUS- Observatories and Research Facilities for European Seismology
6. Natural and Technological Disaster Prevention Open Partial Agreement (EUR-OPA)
7. UN OCHA ODSG -Office for Coordination of Humanitarian Affairs, Donor Support Group
8. OECD Organization of Economic Cooperation and Development Risk Forum
9. IPA CPM- IPA Civil Protection Mechanism
10. GFDRR- Global Facility for Disaster Risk Reduction
11. BSEC- Black Sea Economic Council
12. ECO- Economic Cooperation Organisation

International Agreements, MoU and Protocols

Macedonia, Bulgaria, Azerbaijan, Romania, Kazakhstan, Bosna and Herzegovina, Indonesia, Afghanistan- Pakistan, Hellenic Republic, UNHCR, OCHA, Pakistan Islamic Republic, UNDP, Albania, Dominican Republic, DPPI SEE, UNICEF-Myanmar, Georgia, Kosovo, Japan

4. Disaster Management Strategy, Policy and Plan

Turkey is located in a geographical region where Europe, Asia and Africa are joined. The active fault lines lead to major earthquakes (Figure 15). The earthquake is being in an area where the population is dense, its duration, frequency, occurrence of the daytime or night, the damage to sensitive industrial and infrastructure facilities are likely to increase the loss of life and property. On the other hand, when the landslides, avalanches, floods, rock falls, tsunami etc. that occurs with the effects of the earthquake, come together with the earthquakes, the size of the disaster and its impact on society is also growing. Turkish society, who learns to live with disasters, has achieved to overcome wounds and difficulties due to economic and social solidarity. However, the increase in the mass migration from rural to urban areas and from the east to the west has led to an increase in weak building stock and urban sprawl within the last 60 years. This process caused clustering of 75% cities with heavy industry and 41% of the dam in the second-degree dangerous earthquake zones. A disaster that occurs in a region where large industrial and infrastructure facilities exist not only affects all of Turkey but also can affect the other countries where economic relations are intensive with Turkey.

The most common disaster type in Turkey is earthquakes. 75% of earthquake related deaths occur due to collapse of the buildings. According to the active earthquake zone map, 96% of the Turkey's lands and 98% of the population are living in the earthquake zone. Three-quarters of the city's where the industry is intense, half of the dams are located in second degree dangerous earthquake zones. On the other hand, in recent years, very large energy (nuclear power plants, oil refineries, natural gas and oil pipelines and storage facilities), infrastructure (continent linking offshore bridges and marine underground passages, highways, dams) and industrial facilities have been planned and maintained. Despite having experience with large disasters, Turkey's vulnerability towards disaster risks that can harm critical facilities and can have huge social and economic effects still continue.

On the other hand, while the fight against climate change continues disasters with the long process such as soil loss due to wind and flooding, landslides, desertification and potholes resulting from the withdrawal of the deep waters, rapid decline of the forest reserves and agricultural land are still highly critical (Figure 14). It is thought that when a tsunami danger appears in the sea sides of the Turkey, which has 8,333 km length, as in the other parts of the world the existing plans are expected to be ineffective.

In Turkey's developments plans, disaster and emergency plans, annual programs, sectorial and strategic plans, Turkey has taken serious measures towards disaster risk reduction. However, in case of more than one danger mentioned above at the same time or within the same periods, the developed risk reduction and risk transfer mechanisms are expected to be insufficient. In this context, activities conducted for prevention, mitigation,

preparedness and vulnerability reduction with the sustainable development policies, plans and programs should be integrated with each other in a more effective manner.



Figure 14. Disaster Risk Profile of Turkey

DATE	TYPE	Intensity (MMI)	LOCATION
960	Earthquake	VIII	İstanbul
1869	Fire	-	Samsun
1878	Earthquake	VIII	İzmit, Bursa, İstanbul
1992	Earthquake	VIII	Erzincan
1999	Earthquake	X	Kocaeli
1999	Earthquake	X	Gölcük
2011	Earthquake	VIII	Van

- 96% of Turkey is under the danger of earthquake hazard
- 66% of seismic belt is right on active faultlines
- 72% of population and 75% of industrial plants are under the [Earthquake Risk](#)

Figure 15. Major Earthquakes in Turkey

4.1 National Strategy for Disaster Management of Turkey

Turkey is preparing National Strategy for Disaster Management of Turkey with an integrated approach. The Strategy covers all the phases and all the actors of the disaster management cycle and identifies the policies and actions that can be implemented over the long run to reduce risk and future losses. It concentrates on the prevention and mitigation phases in order to reduce possible future risks and losses and is the guideline to manage disaster and support sustainable development. It targets building disaster resilient community.

National Strategy for Disaster Management of Turkey is a document that makes all institutions and organizations in the country, aware of national disaster management understanding, concepts and strategic objectives; ensure the development of a shared understanding and modality about disaster preparedness; and lay down a framework about what must be done and what must be provided to secure efficient disaster management.

4.2 National Earthquake Strategy and Action Plan (UDSEP-2023)

The main aim of National Earthquake Strategy and Action Plan-2023 (UDSEP-2023) is to minimize the possible physical, economic, social, environmental and political damage and losses or effects of earthquakes and to create living areas that are resistant, prepared against earthquakes. With UDSEP, safe accommodation and structuring and also ways to struggle with the effects of earthquakes have been clarified and establishments and foundations responsible or relative for every step have been determined. The vulnerability is tried to be reduced with the project, in which duty distributions are made to the related and responsible institutions and organizations in Turkey after a potential earthquake. So this aims to reduce the vulnerability. The steps of this project that has increased intervention ability after an earthquake has occurred could be presented systematically with a chart.

The strategy document is formed along;

- 3 principal themes,
- 7 objectives,
- 29 strategies
- 87 action items
- 13 responsible agencies have been designated for implementing the cooperative work.

4.3 Turkey National Disaster Response Plan (TAMP)

Turkey is a disaster-prone country due to geological, topographical and meteorological conditions. Hence, we face frequently with disasters that lead to loss of life and property. %96 of Turkey's land is on various seismic hazard regions, with larger part being located on 1st and 2nd degree earthquake zones. Urban and rural areas must live and fight with not only

earthquakes but landslides, floods, rock falls, avalanches, etc. In order to manage and prevent these situations, Disaster and Emergency Management Authority (AFAD in Turkish) was established in 2009 under Prime Ministry (was abolished).

After Van Earthquake (October 2011) the need for a plan was clear as the current legislation in Turkey are no longer fulfilling today's needs. New studies and plans on disaster management emerged due to the advancement in technology and increase in disaster awareness among people. Following a detailed inspection on types of events; a plan was created to define the roles and responsibilities for every involving party in disaster and emergency response situations to determine the basic principles of response plan in all three phases: before, during and after the disaster and emergency situations. AFAD named this plan as Turkey National Disaster Response Plan (Türkiye Afet Müdahale Planı - TAMP in Turkish) (Figure 16).



Figure 16. Structure of TAMP

TAMP is flexible, modular-structured and adaptable to all types and scales of disasters and is responsible for the planning and coordination of the public institutions and non-governmental organizations in the event of a local/national level disaster to minimize the loss of life and property by efficient resource management (Figure 17). TAMP gives responsibilities to the personnel of all the parties involved (ministries, the public institutions and non-governmental organizations) in the wake of a local/national level disaster to work under 28 service groups. Personnel, equipment and resource analysis will be carried out to analyze the current situation and identify the strengths and weaknesses to increase the disaster and emergency management capacity in Turkey.

TAMP was created under these four basic principles:

- Extensive and detailed (preparation, response, recovery phases)
- Covers disasters of all types and scales
- Contains full responsibilities and roles of each and every one of the major and supporting associates
- Essentially based on taking immediate action using local, regional and national response capacity.



Figure 17. Vertical and Horizontal Integration of TAMP

In the light of these basic principles, the aim was to create a flexible, quantitative and therefore scalable and effective plan using information management and communication on all cylinders to keep all parties in the same page for continuous coordination.

The goals of TAMP:

- Saving lives
- Returning interrupted lives and activities to normal as soon as possible
- Fast and planned response
- Protect and maintain public health
- Protect property, environment and cultural heritage
- Reduce economic losses
- Prevent secondary disaster or mitigate the effects
- Ensure efficient use of resources

The plan is based primarily on coordination, cooperation and collaboration. There are 28 service groups under a total of 4 services to ensure minimum hierarchy and maximum efficiency with modular structure according to the event type and size of response

organization. 4 services are coordinated under Prime Ministry (was abolished) or AFAD Disaster and Emergency Management Center depending on the severity of the situation.

1. Operation Service: The basic unit responsible for implementing the response organization.
2. Information Service: During the response, this service is responsible for identifying the sources for needed data, data collection and analysis, conducting reconnaissance, situation reports, situation assessment and also to create alternative strategies by modelling and risk calculation by analyzing data from geographic information systems (GIS), maps, databases, remote sensors.
3. Logistics and Maintenance Service: Is responsible for establishing facilities, providing the necessary equipment to support the service groups involved in response activities.
4. Finance and Administration Service: In the scope of the preparation works before the disaster, the financing needs that may be required should take place in the strategic plans of instructions and organizations within the framework of 5018 Public Financial Management and Control Law. For administrations using the general budget administration, all types of disaster and emergency management investments from the general budget is monitored and coordinated by AFAD.

Ensuring the sustainability of interrupted services in disaster and emergency situations requires coordination and organization at ministry level. In this regard national level service groups were established and for each service a ministry/NGO was assigned as a major associate (Table 6). These service groups are created according to the needs in emergency and disaster situations.

A major associate is the responsible party for the service group, and determines the roles and tasks of ministries, intuitions and organizations they choose to work with, thus the supporting associates. All service groups should work in coordination with AFAD.

The supporting associates should take part in preparation of operational plans, support the execution of operations, and meet the demands of the major associates while providing trained personnel, equipment, tools etc.

There are a total of 10 ministries and NGO's assigned as major associates and over 100 of supporting associates.

Table 6. National Service Groups

Nr	Name of Service Group	Name of Institution/Ministry/NGO	Service
1	Purchase and Lease	AFAD	F&A
2	Accounting, Budget and Financial Reporting	AFAD	F&A
3	National and International Donations In-Cash	AFAD	F&A
4	Information Management, Evaluation and Monitoring	AFAD	Info
5	Service Group Logistics	AFAD	L&M
6	Resource Management	AFAD	L&M
7	International Support and Cooperation	AFAD	L&M
8	Search and Rescue	AFAD	Ops
9	CBRN	AFAD	Ops
10	Accommodation	AFAD	Ops
11	Energy	Energy and Natural Resources	Ops
12	Damage Assessment	Environment and Urban Planning	Ops
13	Infrastructure	Environment and Urban Planning	Ops
14	Debris Removal	Environment and Urban Planning	Ops
15	Nonmonetary Donations, Warehouse Management and Distribution	Family and Social Policies	L&M
16	Psychosocial Support	Family and Social Policies	Ops
17	Loss Estimation	Finance	F&A
18	Food, Agriculture and Livestock	Food, Agriculture and Livestock	Ops
19	Health	Health	Ops
20	Fire	Internal Affairs	Ops
21	Evacuation and Placement Planning	Internal Affairs	Ops
22	Safety and Traffic	Internal Affairs	Ops
23	Interment	Internal Affairs	Ops
24	Nutrition	Red Crescent	Ops
25	Technical Support and Supply	Transport, Maritime Affairs and Communications	L&M
26	Communication	Transport, Maritime Affairs and Communications	Ops
27	Transportation, Infrastructure	Transport, Maritime Affairs and Communications	Ops
28	Transportation	Transport, Maritime Affairs and Communications	Ops

TAMP serves as an upper plan outlining how to conduct response works in disaster and emergency situations, capable of adapting to all scales in local and national incidents.

Primarily, National Level Service Group Plans are prepared together with all the national level major and supporting associates with the help of TAMP. The next step is the preparation of Provincial Disaster Response Plans and Local Level Service Group Operation Plans. Through these plans, just like in the national level, the roles and responsibilities will be clarified at the local level in case of disaster and emergency.

The national service group plans that are established in the ministerial and institutional level form the “Service Model” by preparing the plans, coordinating and being responsible for their related services. Each service group will serve as a sub-model for the system and an example and guideline for local level service group plans. The national response system is designed to give qualified support to the local system, thus the disaster zone.

The relationship between the service groups at the national level and the local level is the execution of national support function to the disaster zone. The disaster and emergency

response management at local level is designed as a single model to ensure standardization nationwide.

Response Levels:

Response levels are divided into four groups in terms of the degree of impact

Level 1: Provincial Disaster and Emergency Management Center (DaEMC) is active and AFAD DaEMC follows and evaluates the situation. If needed AFAD informs the required service groups and may use their capacity for the requested assignment.

Level 2: Provincial DaEMC is active, teams from supportive neighbouring provinces and regional Search and Rescue (SAR) brigades move to disaster zone without waiting for further orders. If needed, AFAD informs the required service groups and may use their capacity for the requested assignment.

Level 3: AFAD DaEMC is active, representatives from all service groups gather at Prime Ministry (was abolished) DaEMC. Teams from supporting provinces and regional Search and Rescue brigades move to disaster zone without waiting for further orders, and national capacity is at full use.

Level 4: In addition to full national capacity used at Level 3, calls for international support are made by the government.

5. Budget Size on National Level

There are two types of budget for DRM Issues.

1. Project/investment budget: With the approval of Ministry of Development all DRR and risk assessment project proposals are evaluated based on the criteria. At last this budget is legalized and put into practice with publishing Budget Law in Official Gazette.
2. Current Expenditures/ Cost Budget: are proposed by AFAD based on evaluations including identification and estimation. Then this budget are discussed in Ministry of Finance with AFAD and finalized develop on evaluations including identification and estimation. At last this budget is legalized and put into practice with publishing Budget Law in Official Gazette.

Reservation of funds: after both budgets are published in Official Gazette of Turkish Republic, it means that all those budget allocations were done and reservation of fund are provided with this process.

6. Recent Projects on Disaster Risk Reduction

6.1 Turkey Integrated Disaster Hazard Map Project

Integrated Disaster Hazard Map Project has been developed as a vital tool to minimize damage caused by disasters at national, regional, and provincial level. Studies on the content of the guidelines explaining preparation of integrated disaster hazard maps specific to landslides, avalanches and rock falls have been completed. Guidelines are;

- Focusing on disaster risk assessment and risk management,
- The first and only national document in the natural disaster platform,
- The first technical document in this platform,
- The only standard about national disasters in Turkey,
- The baseline studies for vulnerability studies.

Within the context of "Integrated Disaster Hazard Map Project" which will be basis for risk reduction studies, AFAD has taken a leading role in raising disaster awareness in our country and in putting this awareness into practice.

The preparation of the disaster hazard maps is one of the most important products of these efforts (Figure 18). The guidelines prepared within the context of Turkey Integrated Disaster Hazard Map Project can be given as a "best practice."



Figure 18. Mass Movements Guideline

6.2 TAF-RISK

Within the scope of TAF-RISK, disaster and emergency analysis work have been done in earthquake, flood, mass movements (landslide, rockfall, avalanches), forest fires, storms, drought, mining accident, travel and transportation accidents (air, rail, road, sea), marine pollution causing accidents, major industrial accidents, events CBRN (chemical, biological, radioactive, nuclear), population movement (migration, asylum), and risk algorithms have been researched and developed and impact analysis have been carried out in 4 specific types of disasters (earthquake, flood, mass movements, major industrial accidents) in the selected pilot province.

In the second leg of the project; sensor technologies for disasters have been investigated.

TAF-RISK aims to build a resilient society in Turkey by using more R&D activities to predict the risk. Various statistical analyses have been made after the determination of the population and buildings that vulnerable to disaster regions. As a result of this analysis the disaster risk index in the provinces exposed to the dangers is intended to be prepared.

TAF-RISK is planned to be adapted to the existing software before a disaster happens to determine the risk evaluation of different types of disasters by creating a variety of models. Thus, predictions may be made according to the graded provincial disaster risk values in physical and economic losses and social impacts. As the output of the project; provincial disaster risk values can be estimated, mitigation and budget planning R&D activities can be carried out more effectively in advance.

6.3 Capacity Building for Effective Disaster Risk Management Project

“Capacity Building for Effective Disaster Risk Management Project” is being carried out with JICA – AFAD cooperation since August 2013. As an outcome of the project; “Local Disaster Risks Reduction Plan and Risk Evaluation (earthquake/tsunami, landslide and man-made disasters) Draft Guidelines” are to be completed.

In addition, organizations detect 27 and analyze risks, ranking in the framework of ISO 31000 Risk Management System considered to be related to risk management. This standard encourages a framework to integrate the processes associated with risk management, namely to proactive management, in line with the organizations’ management, strategy and planning, reporting processes, policies, values and culture. It is the first time that occupational health and safety issues are regulated by a law (Law No. 6331). This law includes all employees regardless of the public and private sector, which reflects a preventive approach. In accordance with the Law, some studies have been started by the Ministry of Labour and Social Security in order to engage domestic law with internationally accepted principles, norms and sanctions in the areas of occupational health and safety. Turkey has signed the “Promotional Framework for Occupational Safety and Health Convention (No.

187)” in 2014. In addition to this, work on “Safety and Health in Mines Convention (No.176)” and the “Safety and Health in Construction Convention (No.167)” continues. The Ministry of Labour and Social Security is implementing a project named “Improving Occupational Health and Safety Conditions at Workplaces in Turkey” (ISGIP) in order to improve those conditions particular to mining and construction industry in which intensive work accidents and occupational diseases are observed. Within the project, training on OHS Management System and Risk Assessment Methods has been completed. Another phase of the project is devoted to high-risk sectors such as “Textiles, Leather, Food, Furniture, and Manufacture of Chemical Products”.

6.3 Disaster Sensitive Settlement Convenience Maps of Turkey (TADYUS)

The aim of the project is to digitize geological, geotechnical investigation report and any attachments (maps-layouts) stored in paper. Thus, all 22.000 pieces of geological, geotechnical investigation report has been converted into numeric document (pdf-tif-jpg) and thus these maps will be transferred as a numeric data so that geographical information system software can open them. Another study conducted by AFAD is “Digitizing Geological–Geotechnical Survey Appendix Settled Land Maps and Geological Survey (Disaster Survey) Reports Appendix Disaster Area Plan / Maps”. The project aims to pilot areas determined as “Disaster Exposure Zones” in the scaled maps. Thus, digitized disaster exposure zones can be questioned spatially, be offered as a spatial map and the map as a result of expanding or narrowing the boundaries of those zones will be able to prevent ownership problems. “The Land Registry and Cadastre Information System” prepared by the Ministry of Environment and Urbanization in 2012 aims to produce interoperable geographic data models from national scale to local scale regarding building, land / cadastre, administrative units, and transportation. Spatial Real Estate System has been launched by the Ministry of Environment and Urbanization and the General Directorate of Land Registry and Cadastre in 2012. This system is an application aimed to match technical data regarding real estate with land title data and present to citizens by means of map services at international standards, and share with organizations and municipalities.

To provide safe areas and housing for low-income households and communities, it is regulated by the Law on Restructuring of Areas under Disaster Risk 57 (Law No. 6306) that provides subsidies for the interests of credits that people use from banks. Also, with the Law, it is proposed that temporary housing or workplace allocation and monthly rent benefit can be made. By the end of November 2014, 171.436 buildings and totally 387.743 independent units within the 150 proclaimed risk areas and 52.933 buildings, determined as under the risk that are out of risk areas, and 187.247 independent units have benefited from the financial supports provided for their renewal within the scope of the Law. The demolition and rebuilding of 6.500.000 independent units, being almost 1/3 of total building stocks, is projected until

the year of 2023. The Earthquake Regulation implemented since 2007 is among the best in the world. Also, evaluation on the quality building materials, market monitoring and control activities are institutionalized. The legislation for construction business developed and arrangements were made for the use of construction supervisor and certificated workers. Additionally, the design and construction of the buildings and facilities of Turkish Armed Forces are provided as resilient against natural disasters such as earthquake, strong wind, fire, streak of lighting etc., according to the legislation.

In Turkey, compulsory earthquake insurance implementation began in 2000 and the Turkish Catastrophe Insurance Pool (TCIP) is responsible for insurance coverage against earthquakes. The increase in the number of insured housing has been achieved by adding utility services subscription as compulsory requirement insurance applied to the land register and housing credit transactions with the Turkey Catastrophe Insurance Law No. 6305 that be-came effective in 2010. The law allows insurance for other disasters. When insurance companies failed to provide coverage, Insurance Pool provides coverage including food, storm, land sliding, hail, snow slide and the like natural disasters with the decision of Council of Ministers. Compulsory earthquake insurance covers the areas within the borders of municipalities as a priority (Figure 19). However, works are going on to include settlements within the boundaries of villages in compulsory earthquake insurance scope. The number of housings entering into the compulsory earthquake insurance system has increased from 28% to 36% in 2014. The target of TCIP is to raise this to 60% until the year 2017.



Figure 19. Earthquake and Agriculture Insurance

6.4 Disaster Management and Decision Support System (AYDES)

Disaster Management and Decision Support System (AYDES) developed by AFAD will enable the integrated management and follow-up of all stages of disasters electronically so that decision makers can reach the data needed rapidly and most correctly within disaster management processes (Figure 20). AYDES aims to provide a management model that entails the necessary informatics infrastructure and the decision support system base needed to perform the planning, preparation, response and recovery processes regarding the disaster and emergency management, and it will make disaster management sustainable.

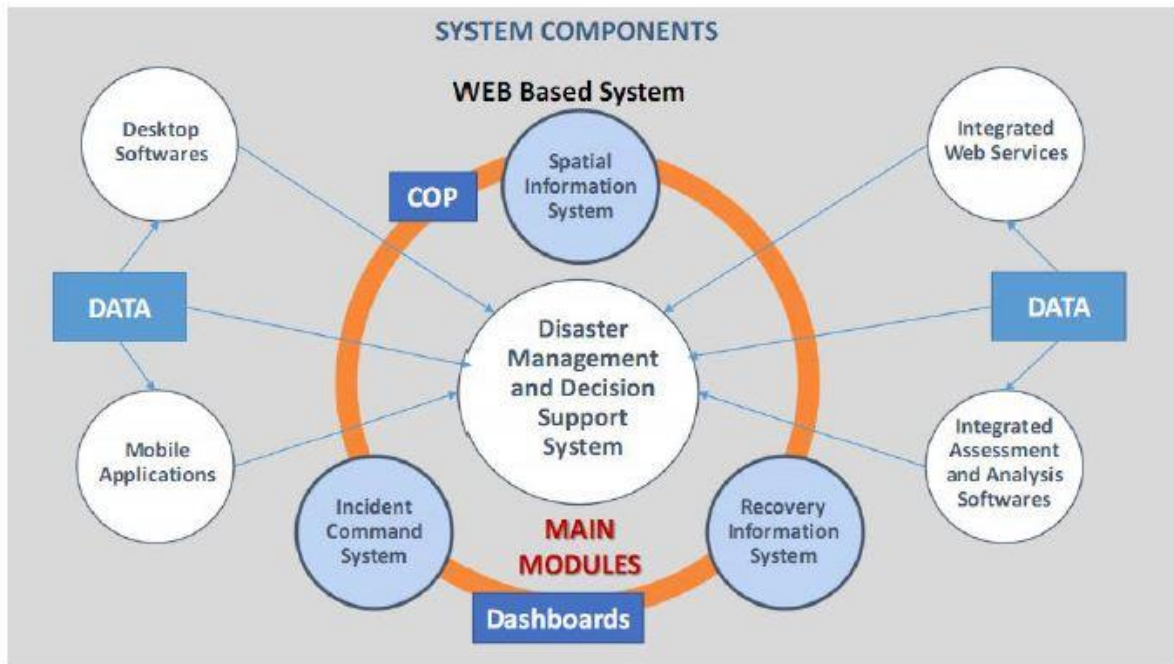


Figure 20. System Components of AYDES

AYDES is a smooth and flexible system that is constructed on the secure and uninterrupted system infrastructure, and is based on Geographical Information System and Common Operating Picture, and has the database integrated with the relevant institutions and organizations, and can be used by all stakeholders that have a duty in disaster management, that can perform resource management efficiently which has the Central Command Control and Decision Support Mechanisms (Figure 21).

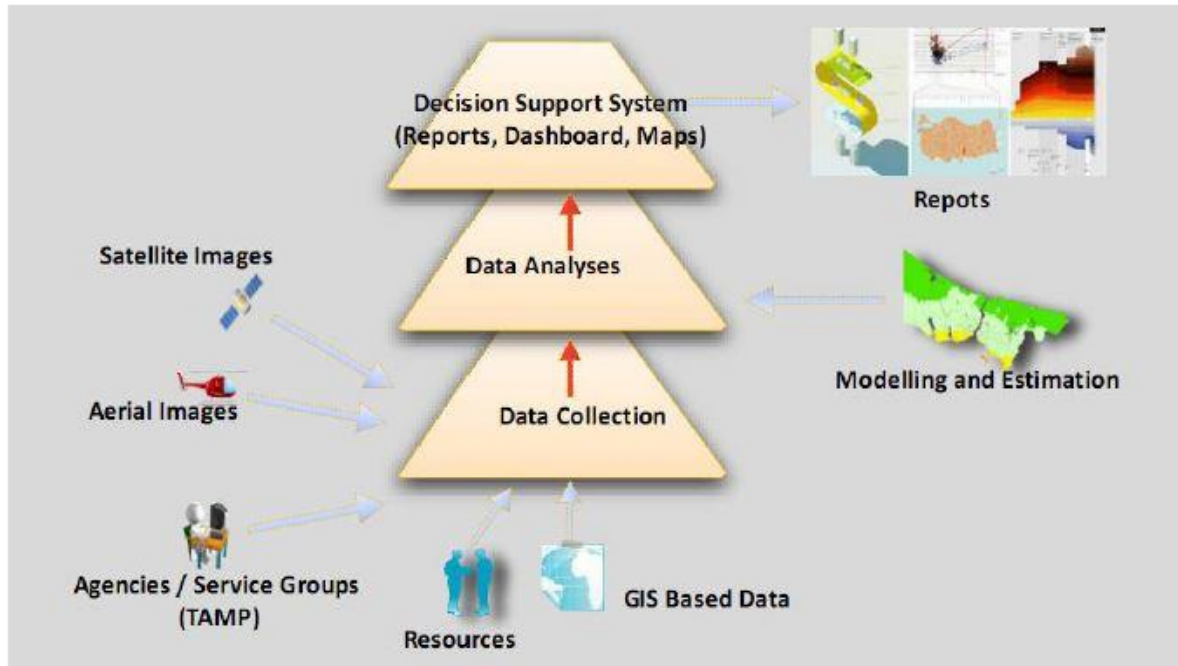


Figure 21. General Structure of AYDES

Disaster Management and Decision Support System that is developed to ensure all that coordination will be used in pre-disaster preparation and mitigation stage, in response stage during a disaster, and in recovery stage in post-disaster period. AYDES will comprise of all emergency stages within the scope of Disaster Response Plan of Turkey. It is a web-based information management system that will enable the monitoring and management of resources such as personnel, vehicles, material, equipment, Service Team information, and facilities as well as providing information on the needs and demands of the service teams. It will also define the situations by answers the questions of what, where, how, when, why, who and with whom in addition to providing an opportunity to work together with the institutions and organizations related to disasters. It is a sustainable system that creates a common language for disaster management.

AYDES creates a disaster and emergency database by collecting all data from related institutions and organizations that can support decisions to be taken in response phase and be used in disaster management. To that end the aim is to reach the data in disaster region in a rapid and correct way for disaster management, so that information can be quickly produced from that data which can efficiently and effectively support the activities to be carried out in the disaster zone.

Definition of the situation and identification of the area of its influence are crucial in order to know to activate the disaster response plan during a disaster and to estimate the damage. AYDES ensures definition of situations by manual or automatically data entry depending on the type of the incident at the time of disaster. It is of utmost importance to

receive and deliver the news to the right correspondents about any disaster or emergency. After the first evaluation of the disaster, AYDES sends automatic notifications via SMS, e-mail and intra-AYDES messaging channels as per its pre-defined notification templates. Thanks to this system all institutions ensure coordination during disaster, meaning zero minute and avoid losing life saving time. Definition of incident activates the provincial response plan, and Province, AFAD, Ministry, Prime Ministry (was abolished) Disaster and Emergency Management Centres come into play according to the magnitude of the incident.

Automatic modelling is a possibility to carry out various Area of Impact Analyses by using top-notch technological tools besides the manual definitions which may result in a more rapid and precise response by using the advanced technological tools such as the images obtained from satellites and air vehicles. For instance, Earthquake Preliminary Damage Estimation System developed by AFAD calculates the area of impact of an earthquake automatically and displays it on AYDES screen during earthquakes encountered by Turkey frequently.

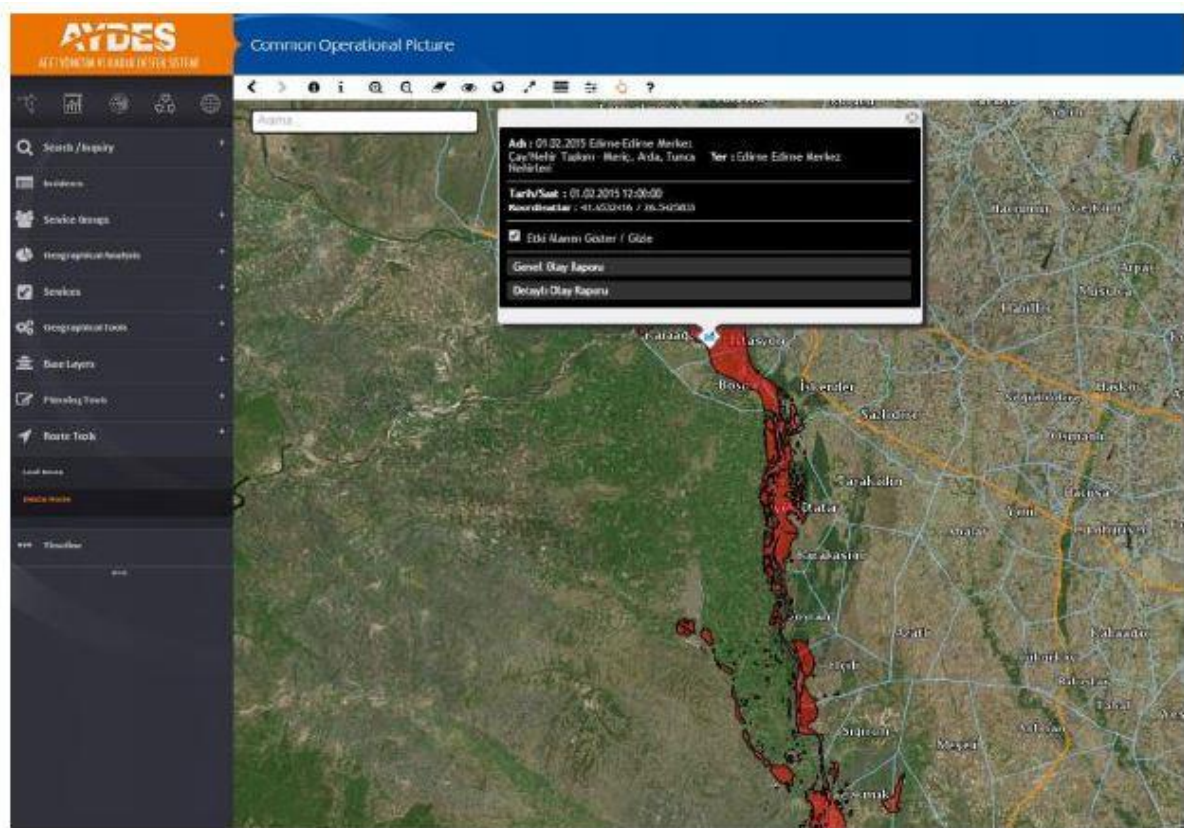


Figure 22. One Example for Flood (in Edirne Province)

AYDES provides the estimation of information like broken down damaged buildings and casualties at district or provincial level to have an idea in mind to estimate the need for

material and the amount of it at the beginning of a Disaster and Emergency Response Process. This information helps decisions to be taken on amount of tents, blankets and food to be sent. Taking decisions as per the statistical estimation data increases the efficiency of the response.

AYDES establishes an efficient resource-demand management system. Data obtained via disaster information forms from the area of incident appear on the display panel and maps of Disaster Management and Support System to perform incident analyses and reporting. Resource management is very dynamic thanks to the flexible structure within the resource management and the efficient data updating approach. Through that it is aimed to deliver the necessary help and support efficiently by transforming the coordination of response among Disaster and Emergency Management Centres and service teams into data rapidly.

Data obtained from the service teams in disaster region comprise information about damaged buildings, number of people affected, closed roads, collapsed communication networks, number of people in need of accommodation (Figure 22). This information is sent to Disaster and Emergency Management Centre via a form called ABIF, namely disaster information form. Thanks to the light shed by these information AYDES enables an efficient management of resources and demands in the disaster zone; and it provides information to the decision makers to set the estimations on search and rescue teams, number of health personnel as well as accommodation and nutrition.

6.5 Disaster Temporary City Management System (AFKEN)

The Disaster Temporary City Management System (AFKEN) is a software system for the management of temporary accommodation centers, including container and tent cities, which are established for the temporary accommodation of the survivors of disasters or extraordinary situations. The system is under the coordination of AFAD, with the intention being to provide the best possible service to disaster survivors.

The Disaster Temporary Urban Management System (AFKEN) allows the following processes to be carried out. All statistical data and reports can be followed up electronically from a single center:

Data input regarding the creation of temporary accommodation centers, as well as capacity, settlement area and sufficiency data pertaining to these accommodation centers (Figure 23).



Figure 23. System Process of AFKEN

- Registration and identification processes of guests living in the temporary settlement centers.
- Entry-exit controls of temporary accommodation centers.
- Education and Course Management.
- Healthcare Processes Management.
- Aid Management.
- Warehouse Management.
- Staff Management.

The spread of the AFKEN system has facilitated the establishment of a standard approach to the management and administration of accommodation centers.

6.6 Turkey Ready for Disaster

Starting with individuals to all segments of society, objectives of Turkey are to bring preparedness of disaster culture for the first 72 hours of disasters, to raise awareness, to share basic disaster countermeasures in their residence, to teach and ensure them to carry out proper pattern of behaviour during disasters, to share basic precautions they can take with the information towards disaster and emergency plans, to popularize places where they can get trainings for disaster and set up easily accessible substructures for these places, to standardize disaster trainings which are given by various channels in nationwide, to make use of studies performed by international organizations and constitute accredited training ways with enough knowledge and experience.

“Disaster-Prepared Turkey” campaign to raise public awareness of disaster issues and create a disaster-sensitive culture. Four different projects have been planned, focusing on disaster-prepared families, schools, workplaces and young volunteers (Figure 24).

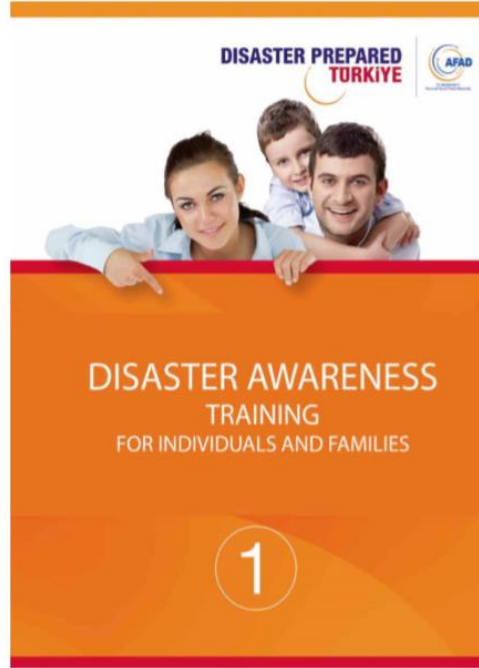


Figure 24. Disaster-Prepared Family Training Material.

6.7 Turkey Earthquake Data Center System (TDVMS)

The Project of Turkey Earthquake Data Center System aims to establish a system where all the data that comes from the observation stations which are managed by different establishments, research centres and universities in Turkey including stations that are managed by AFAD, is stocked, kept and is presented to share with all the users.

The system in question, has been put into use with 29459 numbered legislation issued in the official newspaper dated 28/08/2015. The Project got its support for establishing its data processing ground work from TÜBİTAK – ULAKBİM which are Turkey’s academic network establishers and managers. The keeping, presenting and providing safety of the data gathered under the roof of AFAD-TDVMS are also subjects that TÜBİTAK – ULAKBİM take care of. The steps of transfer, control, arranging and of course the changing to common formats, distribution of data is continuing to be made by the data processing centre already established under AFAD. And this helps scientist and related establishments to get the information about earthquakes. This system has provided accessing the data by the community, general public, academia and all other stakeholders easily.

6.8 Integrated Warning and Alarm System (IKAS)

The Civil Defence Act No. 7126 in accordance 24-29; air strikes, natural disasters, chemical, biological, radiological, and nuclear hazards in time to provide for precautions against the public's stimulated, in order to prevent or minimize loss of life and property retrieval across the country and news dissemination, warning and alarm system was established (Figure 25).

In order to provide communication between the relevant agencies in disaster and emergency situations as a pilot in Ankara, Ankara, Eskişehir and Zonguldak disaster and emergency centers and METEOROLOGY - TAEK - OGM - DSI - TRT between seamless and secure communication system was established.



Figure 25. Early Warning and Alarm System

The news received from news source institutions may be under threat of danger to people in the area who have been warning that the current system established to provide renewed in accordance with today's technology, it is also performed in order to assist with a warning siren audible alerts, SMS, mobile and social Messaging, the integrated warning and alarm system installation has been completed as a pilot project in Zonguldak.

IKAS System consists of three subsystems;

System retrieval and dissemination of news; news from the institutions news source hazards in areas that remain under threat of disaster and emergency provincial disaster and emergency Centers, seamless and secure communication system through on-line will be transferred as quickly.

Warning and alarm systems; disaster and emergency centers reaching air raids, and CBRN hazards news, sirens and voice announcements with institutions/organizations, and making available to the public will be provided. Electronic communications and Alternative Energy with the support of a warning siren system with a single or bulk can be made. As well

as audio recording alert and a live announcement can be made in the system.

Textual warning system; "IKAS" Project within the scope of disaster and emergency news messages to be sent to mobile cellular phones living in the danger zone outside the field of public and relevant public officials warned of the sirens and the announcement, while Facebook, Twitter, etc. via social media will be published. Also, iOS/Android application for mobile phones with operating system IOS AFAD has been developed; with this application the news of the disaster can be transmitted via smartphones to the public as the aggrieved citizens in the event of a disaster a "disaster declaration" button, using location data to the emergency center and the provincial disaster status, image, and video will be able to convey pulling. The application in question can be queried with past disasters, the closest meeting places and centers to help the victims of the disaster themselves, will be able to see on the map.

6.9 The Technological Disasters Roadmap Documents

These documents covered Major Industrial Accidents, Accidents Caused by Mining and Mining Wastes, Enhancing and strengthening the standards on protection from radiation, Protection of critical infrastructures, accidents of dangerous substance transportation, accidents causing marine pollution, biosafety of modified organisms, climate change and associated disasters. AFAD tell the standards and legal issues with these road maps to the related and responsible institutions (Figure 26).

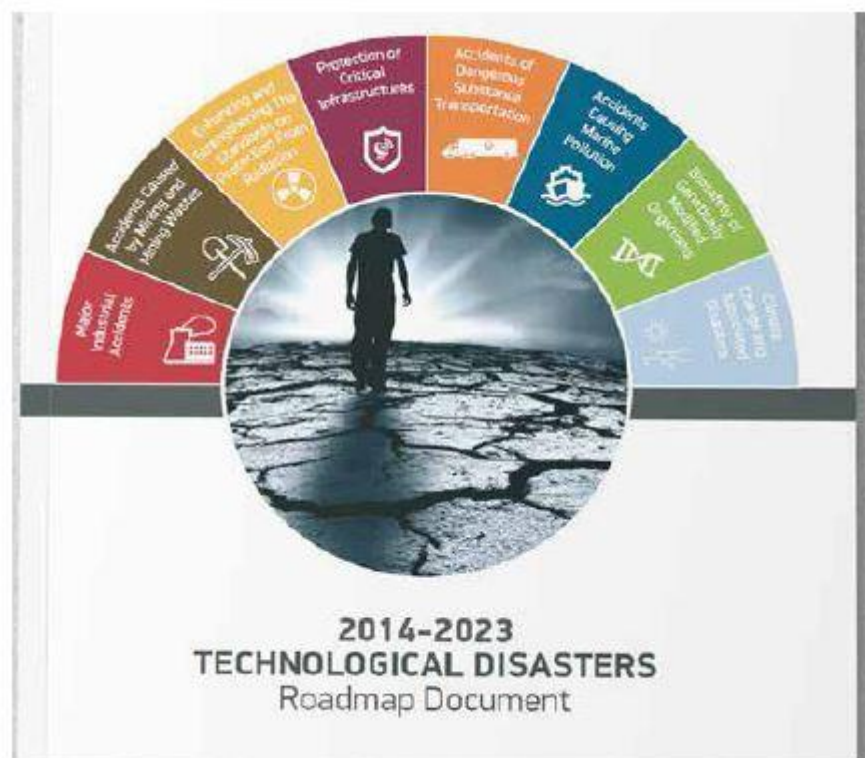


Figure 26. Early Warning and Alarm System

7. Counterpart of ADRC

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8. References

- Presidential Decree No. 4 on Organization and Functions of the Disaster and Emergency Management Authority (AFAD)*
- Law No. 7269 on Measures and Assistancess to Be Put into Effect Regarding Disasters Affecting the Life of the General Public.*
- Law No. 3234 on Organization and Duties of the General Directorate of Forestry.*
- Law No. 3234 on Organization and Duties of the General Directorate of Meteorology (MGM).*
- Law No. 6200 on Organization and Duties of the General Directorate of State Hydraulic Works (DSI).*
- Law No. 6831 on Forests.*
- Law No. 6305 on Catastrophe Insurance.*
- Law No. 6306 on Restructuring of Areas Under Risk of Disasters.*
- Decree-law No. 644 on Organization and Functions of the Ministry of Environment and Urbanisation.*
- Decree-law No. 655 on Legislative Decree on Organization and Duties of the Ministry of Transport, Maritime Affairs and Communication.*
- National Progress Report On The Implementation of The Hyogo Framework for Action (2013-2015)*
- Desk Research Report, Peer Review Turkey (2015).*
- Peer Review Report, Turkey (2015).*

REGULATIONS

- Regulation on Buildings to be Constructed in Disaster Areas.*
- Regulation on Specification for Buildings to be Built in Seismic Zones.*
- Regulation on Disaster and Emergency Expenditures.*
- Regulation on Duties regarding Chemical, Biological, Radiological and Nuclear Threats.*
- Regulation on Disaster and Emergency Response Services.*
- Regulation on Implementation of Law on Restructuring of Areas Under Risk of Disasters.*
- Regulation on Emergencies in the Workplaces.*
- Regulation on Infrastructure for Disasters.*
- Regulation on Road Construction for Disasters.*
- Regulation on the Operation Principles of Natural Disaster Insurance Institution.*
- Principles on Establishment, Duties and Working Procedures of Turkish Disaster Risk Reduction Platform*