

Natural Disasters in Turkey: Social and Economic Perspective

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Abstract: Turkey is located in one of the most significant active seismic regions in the world. The country also is subject to many other natural disasters, that's why, natural disasters have been seen in Turkey forever. These events have caused physical destruction to the death of more than 100.000 people and to the wounding of a lot, and shacked the country's economy in the last century. Disasters sources from geological, meteorological, biological and technological sources, however, the results and effects of disasters involve of interest to social sciences. In developing the social perspective on disasters, the main factor is that disasters are effective on human communities. The development of individual, state and international cooperation mechanisms in combating disasters is a necessity. In this study, it was aimed to review the sociological, economical and psychological effects of the disasters, and to call attention to social scientist on the effects of disasters in Turkey.

Keywords: *disaster; earthquake; social impact; flood; hazard; natural disaster; Turkey*

1. Introduction

Disaster is defined as an event that transcends local capacity, requires national or international assistance (Hoyois, Below, Scheuren & Guha-Sapir, 2006), causes physical, economic and social losses for people who cause great harm and human death, and interrupts normal life and human activities by disrupting human activities (Ergünay, 1996). The severity of a disaster is generally measured by loss of life, injuries, structural damage, social and economic damages resulting from an event that is the result of a hazardous event. The severity of disasters in Turkey is generally higher than the mean of the world. Because, Turkey is located between Europe and Asia with a population reaching more than 80 million. The growth rate of the population, undergoing a very rapid process of urbanization in the last 70 years. The ratio of urban population, which was 26% in 1950, had

climbed to 60% by the end of the century, now is about 91%. Also Turkey has high fertility rate (% 2,14) in the World (TUIK, 2016). This high-density population brings many problems with such as the increase in the number of buildings and settlements. However, the weakness of structures against disasters increases the severity of possible disasters.

While the human factor is more effective in the formation and development of humanitarian disasters; in natural disasters, it can be seen that natural causes are more effective. The source of disasters can be originated from geophysical, atmospheric, hydrological, climatological or biological factor (Table 1) (EM-DAT, 2018).

Atmospheric events can be observed by humans and sometimes necessary precautions can be taken without reaching the disaster dimension. The atmosphere of our world is constantly monitored through satellites from sky and by meteorologists from the ground. However, there is still the possibility of damage from disasters. Some meteorological events cannot be observed directly because they occur over a long period of time. For example, the direct observation of desertification, global warming, climate change, and large atmospheric events such as El Nino-La Nina are quite difficult. Such meteorological events are assessed by their results. Hydrological disasters can be occurred after severe meteorological events; however climatological disasters can be caused by lack of some meteorological factors or carelessness.

Table 1: EM-DAT disaster classifications.

Type	Events
Geophysical	Earthquakes, tsunamis, volcanic activities
Atmospheric (Meteorological)	Extreme temperatures, storms, open air turbulence, acid rain, icing, sea and lake water levels change, frost, el nino - la nina, erosion, storms, air pollution, global warming and climate change, ozone gas depletion, fog and low visibility distance
Hydrological	Floods, landslides, avalanches
Climatological	Droughts, wildfires
Biological	Epidemic diseases, insect bites

Biological disasters occur more slowly than other disasters. This kind of disasters can be controlled by observing the developmental stages of the harmful cause. Sometimes biological and technological factors can bring together in some biological disasters as Bhopal (Broughton, 2005).

Geophysical events as volcanoes and earthquakes take their source from the depths of the Earth. It is quite difficult to determine the natural events of these kinds and to determine the time of arrival. The lack of knowledge of the people on the natural history of place-based events leads to the loss of life and property in such disasters.

1.1. The features of disasters in Turkey

Turkey is a country which has a high average elevation (1132 m) compared to Europe, with three sides surrounded by the sea (Mediterranean Sea, Black Sea, and Aegean Sea). Mediterranean, Continental and Black Sea climate types (similar to Oceanic climate type) are experienced on the country soil. Also important air masses of the world (Siberia HP, Asor HP, Island LP and Basra LP) confront on Turkey. It is possible to observe 4 different seasons in Turkey within a year.

Turkey is constantly facing the danger of natural disasters because of its geographical features. Disasters such as earthquake, landslides, floods, avalanche, drought, wildfires, extreme winter conditions and storms are seen in our country. As seen in Table 2, the most common type of all disaster events in Turkey is the landslide (32,7%) [6]. Climatological factors, geological structure and elevation are influential on occurring the landslides in Turkey.

Moreover, since Turkey is a geologically young country the rock fall events are often seen. Floods are significant natural disasters in Turkey (12,2%). The fact that Turkey is a higher country than Europe; the variation of weather conditions in short distance and time can cause floods. Another type of disaster seen in our country is avalanche (3,8%). There is an avalanche in Turkey, especially in the eastern part of Turkey. More than one natural disaster can sometimes be experienced at the same time. Apart from the above mentioned disasters, other natural disasters such as extreme weather conditions (1,7%) are also seen in Turkey (Table 2).

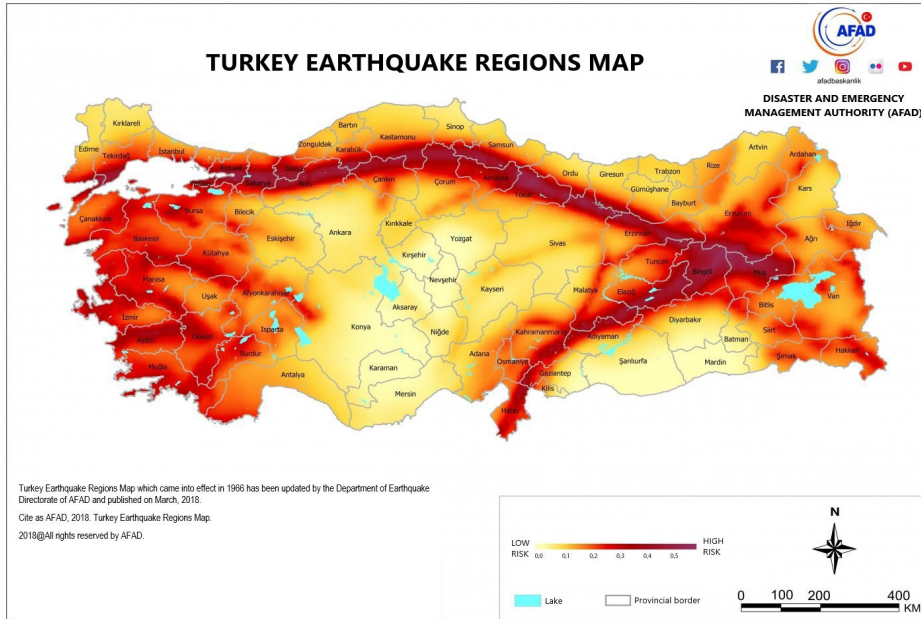
Table 2: The number of death and injured people in disasters in Turkey (1900 - 2018) (TABB, 2018).

	Event		Death		Injured	
	f	%	f	%	f	%
Landslide	16223	32,7	36	0,0	41	0,1
Flood	6069	12,2	232	0,2	116	0,2
Earthquake	3368	6,8	95544	95,6	47411	77,2
Wildfire	2256	4,6	41	0,0	42	0,1
Avalanche	1892	3,8	128	0,1	80	0,1
Storm	1816	3,7	264	0,3	326	0,5
Extreme winter conditions	845	1,7	143	0,1	944	1,5
<i>Explosions</i>	<i>601</i>	<i>1,2</i>	<i>256</i>	<i>0,3</i>	<i>1352</i>	<i>2,2</i>
<i>Urban fire</i>	<i>608</i>	<i>1,2</i>	<i>57</i>	<i>0,1</i>	<i>250</i>	<i>0,4</i>
<i>Terror</i>	<i>441</i>	<i>0,9</i>	<i>202</i>	<i>0,2</i>	<i>548</i>	<i>0,9</i>
<i>Traffic accidents</i>	<i>1359</i>	<i>2,7</i>	<i>1128</i>	<i>1,1</i>	<i>7373</i>	<i>12,0</i>
<i>Other*</i>	<i>14097</i>	<i>28,4</i>	<i>1897</i>	<i>1,9</i>	<i>2941</i>	<i>4,8</i>
TOTAL	49575	100,0	99928	100,0	61424	100,0

* *Victims are affected by more than one event together or separately*

Turkey is located on most important fault zones in the world. It is possible to collect these fault lines in three main regions: North Anatolia Fault Zone (NAFZ), South East Anatolia Fault Zone (SEAFZ), and West Anatolia Fault Region (Figure 1). These fault generations produce severe and deadly earthquakes. Furthermore, the horst-graben system lies in the west of Turkey and has continuous earthquake generating capacity (Ambraseys & Finkel, 2006).

Figure 1. Earthquake Regions Map of Turkey (AFAD, 2018).



NAFZ starts from Van province in the east and extends to Tekirdağ in the west (AFAD, 2018). This fault line is similar to the San Andreas Fault Line in California. Turkey's large and very populated settlements are located on this line. During the historical period there have been devastating earthquakes in this area. These are the important ones in Istanbul (1509, 1766, 1894), Erzincan (1939, 1992), Varto (1966), Bolu (1957), İzmit (1999) and Düzce (1999). SEAFZ is a convex belt extending from Antakya to Hakkari counties in the direction of SW-NE. It is seen severely earthquakes on this fault zone. One of the risky areas in terms of seismicity in Turkey is Western Anatolia. The Big Menderes, the Little Menderes and Gediz depressions; Izmit Gulf coast, Bakırçay Basin, Edremit Gulf coast, Ulubat and Manyas depressions, Bursa, Yenisehir, İnegöl and İznik depressions are located in this earthquake zone (Levy & Salvori, 2000). 96% of Turkey's surface area, 99% of the population and 98% of the industrial areas are located in the first 4-degree earthquake zone considered as risky from the seismic point of view (Türkoğlu, 2001).

1.2. Social, psychological and economic effects of natural disasters in Turkey

Natural disasters caused considerable loss of lives and property even in re-

cent history of Turkey. As a result of natural disasters, in the last century, approximately 100.000 people died, over 61.424 people injured, over 108.573 buildings demolished, and over 1.337.521 buildings damaged in Turkey since the beginning of 20th Century (TABB, 2018).

Earthquakes are the most hazardous disasters in Turkey as in the past and for future. During the known historical period, there have been major earthquakes that have been damaging to life, causing damage and loss of property. The rate of earthquakes incidence is 6,8% in the country, but the effect of earthquake is more than this ration. In the last century, 3.368 earthquakes that have been damaged and recorded in Turkey (Table 3).

Table 3: The number of damaged and demolished buildings in disasters in Turkey (1900 - 2018) (TABB, 2018).

	Event		Damaged buildings		Demolished buildings	
	f	%	f	%	f	%
Landslide	16.223	32,7	21334	1,6	3638	3,4
Flood	6069	12,2	62400	4,7	507	0,5
Earthquake	3368	6,8	1.238.599	92,6	104.136	95,9
Wildfire	2256	4,6	128	0,0	9	0,0
Avalanche	1892	3,8	1179	0,1	135	0,1
Storm	1816	3,7	3648	0,3	23	0,0
Extreme winter conditions	845	1,7	13	0,0	0	0,0
<i>Explosions</i>	<i>601</i>	<i>1,2</i>	<i>226</i>	<i>0,0</i>	<i>1</i>	<i>0,0</i>
<i>Urban fire</i>	<i>608</i>	<i>1,2</i>	<i>961</i>	<i>0,1</i>	<i>56</i>	<i>0,1</i>
<i>Terror</i>	<i>441</i>	<i>0,9</i>	<i>14</i>	<i>0,0</i>	<i>0</i>	<i>0,0</i>
<i>Traffic accidents</i>	<i>1359</i>	<i>2,7</i>	<i>1</i>	<i>0,0</i>	<i>0</i>	<i>0,0</i>
<i>Others</i>	<i>14097</i>	<i>28,4</i>	<i>9018</i>	<i>0,7</i>	<i>68</i>	<i>0,1</i>
TOTAL	49.575	100,0	1.337.521	100,0	108.573	100,0

Turkey, as it has been in the past, is suffering too much due to natural disasters today. In this sense, the Gölcük Earthquake of 7.4 magnitude, which took place on 17 August 1999, has been an unforgettable bitter experience for our country. Only 17,479 people lost their lives in this earthquake and about 43,953 people were injured (Özkan, 2000).

The feeling that someone who lives in an earthquake will feel the first moment is fear and panic. It has been seen that those who suffer from earthquakes are concerned about their family members, are saddened about the dead and wounded in the earthquake, and they try to make sense of life again (Cvetković, Öca & Ivanov, in press) Fear, anxiety, guilt, anger, tension and despair are the most prominent features of this period [13]. The psychological reactions of the people living with the earthquake to the events have been researched about the effects of the people on the depressed people after 1992 Erzincan, 1995 Dinar and 1999 Izmit earthquakes (Karancı, 1999; Sarp, 1999). After one year of Gölcük Earthquake, 1999, posttraumatic stress disorder (PTSD) rate was found to be 43% in the survivors (Başoğlu, Şalcıoğlu & Livanou, 2002). In another study this rate (PTSD) was found to be 25.4% in the survivors living in a tent city after one year of the disaster (Tural, Coşkun, Önder, Çorapçıoğlu, Yıldız, Kesepara, Karakaya, Aydın, Erol, Torun & Aybar, 2004). On May 1, an earthquake measuring 6.4 occurred, centred in Bingöl and felt in the surrounding cities. Özen & Sir (2004) measured the frequency of PTSD in Bingöl and found PTSD was to be 25% after 2 months of the earthquake.

Behaviourally, behaviours such as an excessive arousal state, sleeping problems, changes in appetite, speech disorders, increase in alcohol and drug use, avoidance of certain stimuli are observed in earthquake victims. In a study conducted 16 months after the 1992 Erzincan earthquake, it was determined that the subjects living with the earthquake were more nervous and nervous than those living with the earthquake (Karancı, 1999).

There are also some changes in social situations in people with disabilities. In a survey conducted, 42.8% of the employees were employed before the earthquake, while after the earthquake this rate dropped to 36.8%. The homes of some of the victims were completely destroyed in the earthquake, and some of them were damaged. Most of the earthquake victims have lost their electronic home appliances (television, dishwasher, washing machine, oven, etc.), while at the same time they have been deprived of their income from real estate such as rented houses and shops. These people also stated that they consumed their deposits in the banks after the earthquake. After disasters, a number of cultural changes were also observed. The bonds of social assistance have been damaged, and relative changes have been recorded in religious beliefs. There has been some increase in divorce requests. After the 1999 Gölcük earthquake, there was a de-

crease in confidence in civil society organizations and in the sentence. Nevertheless, there is a growing confidence in civil society organizations such as AKUT (Kasapoğlu & Ecevit, 2001).

Natural disasters lead to massive economic losses wherever they occur. These losses can be in the form of direct, indirect and secondary losses. For example, on 17 August 1999, earthquake-affected area is home to 23% of the country's population, and accounts for 34.7% of Gross National Product (GNP) (Pelling, Özerdem & Barakat, 2002). According to statistics, direct losses in our country are found to be 1% of Gross National Product due to natural disasters in our century. Indirect losses are much more (3-4%). Only the earthquakes of August 17 and November 12, 1999 caused 6.1% of the country's Gross National Income (GNI) (JICA, 2004). It is estimated that the impact on the public finance of the depression is about 6.2 billion dollars. This amount of \$ 3.5 billion is temporary and permanent new residential construction and residential construction. Turkey's industrial and communications infrastructure has suffered a great loss, and direct and indirect losses to the depreciated country's economy amounted to approximately \$ 13 billion (DPT, 1999). It was emphasized that the economic cost of Gölcük Earthquake in Turkey is 9-13 billion dollars (Özerdem & Barakat, 2000).

Earthquakes also occur elsewhere in the world and lead to heavy material damage. For example, it was estimated that the property damage in the 1923 Japan (Kanto) earthquake was \$ 15.6 billion, and that \$ 17 billion in Italy in 1976 was \$ 10 billion (Barka, Altunel & Akyüz, 2000).

Discussion and Conclusion

August 17, 1999 Gölcük earthquake revealed the disruptions and shortcomings of the disaster management mechanism implemented in our country for many years. With this earthquake, critical views on disaster management policies in our country have been developed. After this date, it is seen that a national level understanding of the need for more permanent and radical changes in disaster mitigation in Turkey, rather than post-disaster wound policies, has been reached. A reflection of the change in disaster management and planning in Turkey is also seen in the field of education. More and more emphasis has been given to disaster education in widespread and structured education. Disasters can be assessed through different perspectives in different disciplines. For example, an earthquake is essentially a geological event; however, its effects are studied under the disciplines such as economy, sociology, psychology, geography, history, and law (Öcal, 2000). The development of a healthy perspective on disasters can eliminate the harmful effects of disasters, or even destroy them.

Turkey is exposed to disasters today as it has been throughout history due to its geographical location and features. Since it is not possible to escape disasters, it is necessary to learn to live with disasters. While the formations of disasters are generally described by science, they need to be addressed by the social sciences in terms of their consequences and impacts. Disasters in Turkey also have sociological, psychological, economic, legal, etc. It is understood that there are various influences from the care and that it needs to be handled by the related social sciences. It is impossible for a disaster management to be realistic without considering the social consequences of disasters.

In this study, it was tried to develop a social point of view for the effects of disasters in Turkey. It is a well-known fact that disasters in our world have increased quantitatively and their effects have influenced wider masses. There is a greater need for national and international co-operation in the sense of preparedness and mitigation of disasters than ever. Because events causing disasters do not accept political and administrative borders. Even states that are struggling with each other may have to cooperate with disasters in combat.

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