

**XXVIII INTERNATIONAL SYMPOSIUM ON
MODERN TECHNOLOGIES, EDUCATION AND PROFESSIONAL PRACTICE
IN GEODESY AND RELATED FIELDS**

Sofia, 08 - 09 November 2018

**A SURVEYING BASED STUDY FOR DETERMINATION OF
EARTHQUAKE DISASTER AWARENESS**

R. Cuneyt Erenoglu (TR), Oya Erenoglu (TR)

ABSTRACT

The Biga Peninsula, where the tectonic opening regime and strike-slip effects take place, lies between the North Aegean Sea, North West Anatolia, Eurasia and Africa plates. An earthquake of 4.5 magnitude occurred on January 15, 2017, about 2.5 km east of Gülpınar Village, which is very active due to its seismicity. On February 6, 2017, an activity called earthquake storm occurred in seismology together with an earthquake of 5.2 magnitude to the west of the same village. The aim of this study is to observe the present situation of the disasters, to reveal how the post-disaster relief is realized, to determine the viewpoint of the victims against the public and civil institutions, and to find out what different kinds of expectations are. To achieve this goal, the disaster was chosen as the most affected villages and the surrounding study area. Surveys were conducted by face to face interviews. Questionnaires were formed by taking opinions from Disaster and Emergency Management Presidency, one of the most effective institutions to provide assistance and service to the region. The results of the detailed field work were evaluated with SPSS software in computer environment. In addition, the findings were analyzed with each other and results were obtained at different scales.

According to the results of the research, it was revealed that in the first stage after the depression, the aid reached the region in time. However, it has been observed that there are some legal difficulties in implementing the sustainable life at the point of resettlement in the region and the fact that the disasters are not sufficiently informed. It is thought that within the scope of all the works to be carried out for the disaster areas after the natural disasters, it will be beneficial for the fair distribution of the help of the people who know the region well enough or will be assigned by the local government. It is important that these people and local administrators are trained in disaster awareness in the context of disaster planning. In addition, it is proposed that in the regions bearing the risk of natural disasters, the status of buildings should be determined, if necessary, reconstructed, and the people of the region should be subjected to disaster education.

Keywords: Natural Disaster, Earthquake, Surveying, Planning, Education.

1. INTRODUCTION

The Biga Peninsula, where the tectonic opening regime and strike-slip effects take place, lies between the North Aegean Sea, North West Anatolia, Eurasia and Africa plates. An earthquake of 4.5 magnitude occurred on January 15, 2017, about 2.5 km east of Gülpınar Village, which is very active due to its seismicity. On February 6, 2017, an activity called earthquake storm occurred in

seismology together with an earthquake of 5.2 magnitude to the west of the same village. According to the records of Bogazici University Kandilli Observatory and Earthquake Research Institute, 1454 earthquakes with a size of 2 or more have occurred. 19 of them are 4 or more in size. In order to mitigate the effects of these earthquakes on the victims and reshape the sustainable life, some institutions and organizations have started to work immediately after the disaster in the region.

In the Marmara Region, which is the most active part of our country in terms of seismicity, more than 500 earthquakes have occurred in the last 100 years, over 4 in size. In particular, the North Anatolian Fault (NAF), the most active fault in the region, has had 15 major earthquakes in the same period. Due to the effect of the earthquakes, approximately 1000 km of rupture occurred on the shell surface (Özalp et al., 2013; Duman et al., 2016). Some of them are formed in the fault segments extending in the Marmara Region.

In this study, it was researched by considering how the post-disaster relief was realized, whether the aid was sufficient, what kind of perspectives of the victims were the public and civil institutions and what kinds of studies could be done considering the present situation and needs of the victims. The aim of this study is to observe the present situation of the disasters, to reveal how the post-disaster relief is realized, to determine the viewpoint of the victims against the public and civil institutions, and to find out what different kinds of expectations are. To achieve this goal, the disaster was chosen as the most affected villages and the surrounding study area. Surveys were conducted by face to face interviews. Questionnaires were formed by taking opinions from Disaster and Emergency Management Presidency, one of the most effective institutions to provide assistance and service to the region. The results of the detailed field work were evaluated with SPSS software in computer environment. In addition, the findings were analyzed with each other and results were obtained at different scales.

2. AYVACIK EARTHQUAKE, NW TURKEY (FEB 6th 2017, Mw 5.5)

The largest earthquake in the study area is the Yenice-Gönen earthquake of 18 March 1953, which is the closest point to Tuzla and its immediate surroundings. When the other major earthquakes in the region are examined, it is clear that the Marmara Region is mostly formed by a deformation effect related to strike-slip faulting. In addition, there are normal faults along the northern margin of the NAF and south of the Marmara Region and counter-component earthquakes on the southern limb. On the southwestern tip of the Biga Peninsula, Ayvacık and its immediate surroundings continued to be intensive with the Mw = 5.5, (Mw = 5.5, KRDAE), Mw = 5.3, AFAD, Mw = 5.4, COMU), which started at Mw = 4.6 on January 14, studies are being carried out to observe earthquake activity. The region contains an active earthquake and contains some of the important tectonic elements of the Northwest Aegean region (Figure 1).

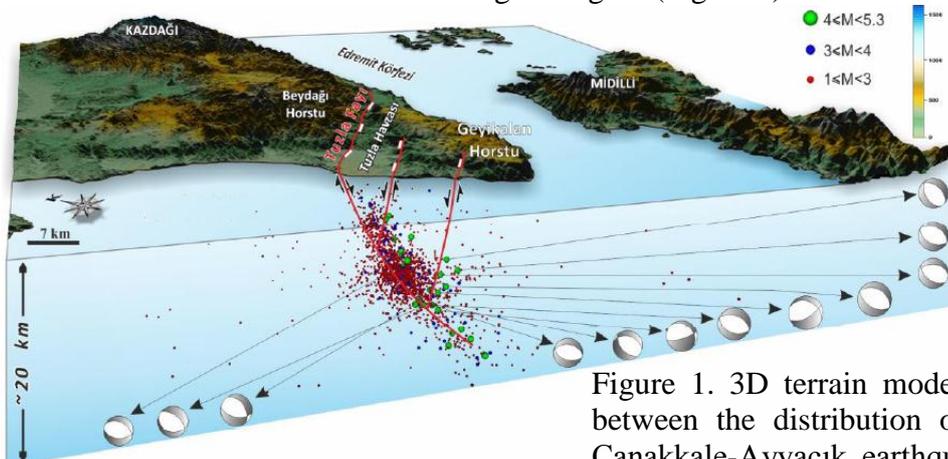


Figure 1. 3D terrain model showing the relationship between the distribution of the focal depths of the Çanakkale-Ayvacic earthquakes and the geometry of the Tuzla Fault to the depths (Sözbilir et al., 2017).

In addition to the intensity and continuity of the micro-earthquake activity in the region, the geothermal fields of the region are covered, and the seismotectonic character of the region is examined and detailed study is required. The density of the station, along with the stationary stations belonging to the national institutions in the study area, will be insufficient to reveal these details. For this reason, it will contribute to the understanding of the tectonic character of the national seismic network or of the data station belonging to the temporary stations. The preliminary results show that transient stations established at close distances according to the main shock and epicentral distributions provide significant improvements in the detection and location of micro earthquakes, especially when compared to stationary networks. On the other hand, in the mid-scale earthquake data, the dominant failure is mainly observed in NW-SE directional normal inclination. According to the records of the Bogazici University Kandilli Observatory and Earthquake Research Institute, the earthquake near Çanakkale-Ayvacık earthquake occurred in the area of Tuzla Village in January / February 2017 and its size is 5.3 and smaller. A significant part of the earthquakes occurred along the deformation zone of the Tuzla Fault. The size of a part of the earthquakes is 4 or more (Table 1).

Table 1. Earthquakes that occurred between 06-07 February 2017 in Çanakkale Ayvacık ($M \geq 4$) (Kandilli Observatory and Earthquake Research Institute / KRDAE, 2017).

#	Date	Time (UTC)	Latitude	Longitude	Magnitude (Mw)	Depth (km)	Focus Mechanism Solution
1	06.02.2017	03:51:40.2	26.11 E	39.54 N	5.3	6	Tilt-slip earthquake
2	06.02.2017	04:17:29.3	26.14 E	39.54 N	4.2	2	Tilt-slip earthquake
3	06.02.2017	10:58:01.3	26.09 E	39.52 N	5.0	8	Tilt-slip earthquake
4	06.02.2017	11:45:01.2	26.08 E	39.53 N	4.2	10	Tilt-slip earthquake
5	06.02.2017	20:22:04.9	26.09 E	39.54 N	4.0	6	Tilt-slip earthquake
6	07.02.2017	02:24:03.4	26.12 E	39.53 N	5.3	8	Tilt-slip earthquake
7	07.02.2017	05:15:51.0	26.12 E	39.51 N	4.3	10	Tilt-slip earthquake
8	07.02.2017	05:17:09.0	26.19 E	39.53 N	4.4	4	Tilt-slip earthquake
9	07.02.2017	21:00:54.4	26.16 E	39.52 N	4.1	6	Tilt-slip earthquake
10	07.02.2017	21:35:00.2	26.18 E	39.52 N	4.0	4	Right-hand direction-strike earthquake
11	07.02.2017	22:53:29.5	26.05 E	39.52 N	4.1	10	Tilt-slip earthquake

2. METHOD

Basic data of our work; surveys made with disasters in the villagers that we have chosen to sample and interviews with the village reeve. In the survey, villagers who were damaged in the Ayvacık earthquake of February 6, 2017, Babakale (20), Bademli (11), Çamköy (8), Gölpinar (18), Koyunevi (8), Taşağıl (4), Yukarıköy) villagers were selected and a pilot application was made. The questionnaire is not a person but a household questionnaire and the number of the questionnaires made at the same time gives the number of the households interviewed at the same time. For the questionnaire evaluations, necessary analyzes were made by using SPSS Statistics 20 package program and frequency tables were extracted and the results were interpreted with the help of graphics.

3. SURVEYING STUDY

A questionnaire was made on the evaluation of the situation of the villagers after the earthquake that took place on February 6, 2017 in Çanakkale's Ayvacık district. In this survey, the distresses and living conditions of village people were evaluated. According to the village right, after the earthquake, Disaster and Emergency Management Presidency teams came to the district immediately after the earthquake and food and urgent needs were met immediately. In addition, the Red Crescent, municipalities, municipalities and many more have mobilized for help. On the third day of the depression, the containers were set up in the districts, the houses were destroyed and the

houses were heavily damaged, and the residents who could not stay in the houses due to the continuation of the earthquake storm. Because of the earthquakes that lasted for a while, after 3 months of need such as food and clothing, everyone tried to establish their own order. During this period, the authorities who came to the region (the ones from the Ministry of Environment, as we learned from Disaster and Emergency Management Presidency) examined the houses and prepared a damage assessment report, and as a result of this report, financial assistance was given to those who were destroyed and who were seriously injured. Household benefits have not yet been concluded and the public has not been informed of this. There were permanent housing constructions to be made in 1 or 2 villages surveyed and no other studies were found in other villages. The general problem of the people of the region is that the people living in the container want to settle in their homes and want their lives to return to normal. The aid given to this area is distributed to the people in certain regions but it is said that it is not transmitted to those who are old and need help. The container is hot in the warmer months, the container is cold in the colder months, and the houses are torn down. As long as there is no return for the construction of the houses, those who are severely damaged have left the containers that have been moved to their homes. There are many unused concessions in the area. The institutions that brought the containers did not go to the area during this period and did not make the evaluation. The people of the region mostly consist of elderly and middle-aged people, and the younger generation has completely migrated from the region. This poses a challenge for the needs of the people of the region. As a result of the surveys we have done, it is difficult for those who need the condition to survive in containers. These people need to move into their homes with permanent housing. There are concerns that these people have been observed to have no financial circumstances but will remain where they collect the containers because they want the money for the houses to be built and because they have to meet this money. Authorities need to worry about informing the public about this issue.

3. LAND REPORT OF AYVACIK EARTHQUAKE SURVEY STUDY

Survey questions were created for the land study dated 27.04.2018. During this period, Çanakkale AFAD Director was interviewed and some information about the field was obtained. A total of 104 people were surveyed with eight mansions targeted for the study. The villages are Babakale, Bademli, Çamköy, Gülpınar, Koyunevi, Taşağıl, Tuzla and Yukarıköy in Ayvacık, Çanakkale. Çanakkale and Ayvacık Special Provincial Administrations were tried to reach the number of the households belonging to the villages but the results were not obtained because they were not official. The existing number of households of the villages from AFAD are as follows (Table 2).

Table 2. Number of Existing households prepared by adding importance and survey numbers from AFAD.

#	PROVINCE	DISTRICT	VILLAGE	EXISTING HOUSE #	QUESTIONNAIRE
1	ÇANAKKALE	AYVACIK	BABAKALE	218	20
2	ÇANAKKALE	AYVACIK	BADEMLİ	113	11
3	ÇANAKKALE	AYVACIK	ÇAMKÖY	30	8
4	ÇANAKKALE	AYVACIK	GÜLPINAR-KIZILKEÇİLİ	508	18
	ÇANAKKALE	AYVACIK	GÜLPINAR-MERKEZ		
5	ÇANAKKALE	AYVACIK	KOYUNEVİ	99	8
6	ÇANAKKALE	AYVACIK	TAŞAĞIL	22	4
7	ÇANAKKALE	AYVACIK	TUZLA	213	13
8	ÇANAKKALE	AYVACIK	YUKARIKÖY-AŞAĞIOBA	217	20
	ÇANAKKALE	AYVACIK	YUKARIKÖY-KARABURUN		
	ÇANAKKALE	AYVACIK	YUKARIKÖY-MERKEZ		
PEOPLE WHO ARE DISCOVERED (ÇAMKABALAK KÖYÜ)				-	2
TOTAL HOUSE NUMBER OF TARGETED VILLAGES				1420	
TOTAL QUESTIONNAIRE NUMBER					104

These surveys were transferred to IBM SPSS Statistics 20 program on computer. (Figure 2).

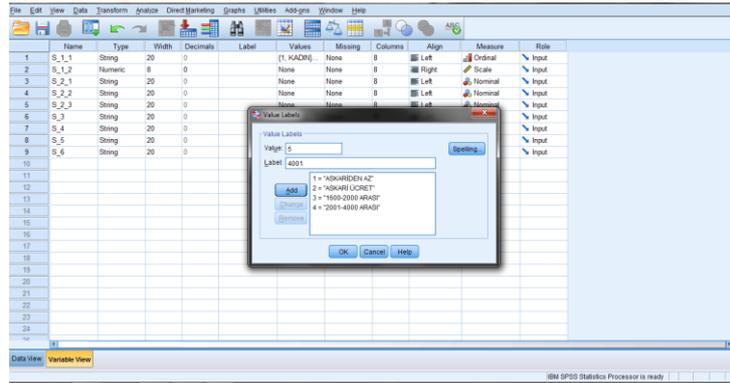


Figure 2. Transferring to IBM SPSS Statistics 20

It will continue in the light of the responses from the questions and the verbal findings on the scene after this phase of the study. The answers to the questionnaires are given in tables. (Tables 3, 4, 5 and 6)

Table 3. Demographic information from the study area.

GENDER	FREQUENCY	%
FEMALE	47	45
MALE	57	44
MARITAL STATUS		
MARRIED	87	84
SINGLE	17	17
AGE		
BETWEEN 18-24 YEARS	2	2
BETWEEN 25-34 YEARS	9	9
BETWEEN 35-44 YEARS	14	13
BETWEEN 45-54 YEARS	23	22
BETWEEN 55-64 YEARS	24	23
65 YEARS AND OLDER	32	31

Table 4. Information on the structure of households.

HOUSE PEOPLE	FREQUENCY	%
HUSBAND AND WIFE	30	29
CORE FAMILY	49	47
EXTENDED FAMILY	11	11
ALONE	13	12
OTHER	1	1

Table 5. Education status.

EDUCATION STATUS	FREQUENCY	%
ILLITERATE PEOPLE	30	29
LITERATE PEOPLE	7	6
PRIMARY EDUCATION	57	55
HIGH SCHOOL	5	5
VOCATIONAL SCHOOL	2	2
UNIVERSITY	3	3

Table 6. Income status.

INCOME STATUS	FREQUENCY	%
LESS THAN MINIMUM WAGE	57	55
MINIMUM WAGE	26	25
BETWEEN 1600-2000 TL	19	18
BETWEEN 2001-4000 TL	2	2
OVER THAN 4000 TL	-	-

104 samples were reached in the study. 55% of them are male and 45% are females. The marital status of the sample is 16% single and 84% married (Figures 3 and 4).

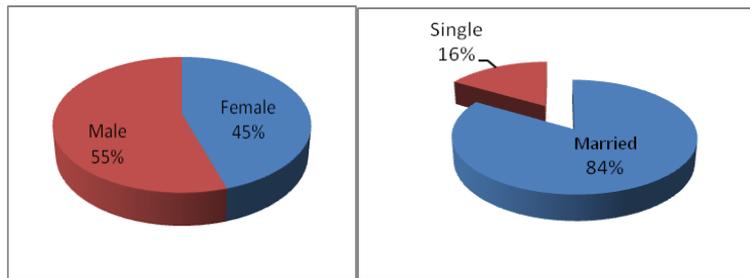


Figure 3. The ratio of female/male and marital status.

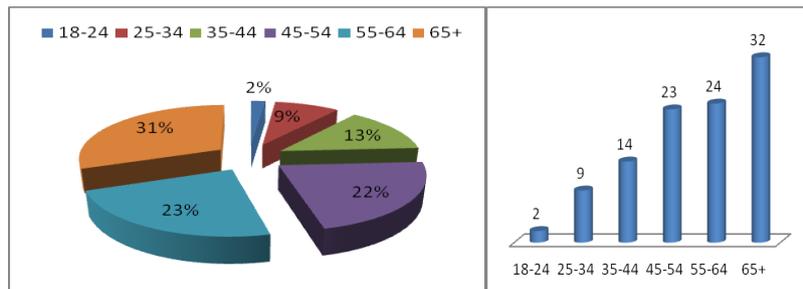


Figure 4. Age range percentage impressions and age range.

According to the answer the question " Who are the household members?", Ayvacik villagers have more core families. Household frequency and percentages were given in Table 4.

During the fieldwork, one cohabiting sister was found and added to the "Other" percentile (Figure 5).

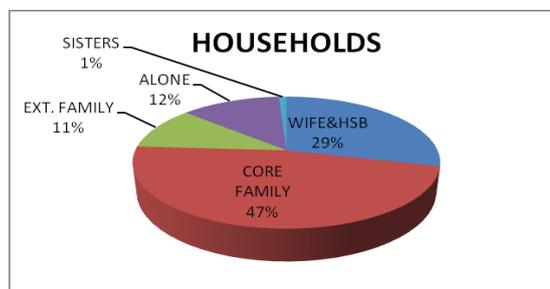


Figure 5. Households (%).

The vast majority of the interviewed people are of primary education and illiterate persons. It is thought that this result does not reflect the fact much if the sample is considered to be unevenly distributed.

Educational status by age is shown in detail in the graphic below. Education status parameters are numbered and added to the table. According to this ; illiterate # is 1, literate # is 2, Primary Education Graduate # is 3, High School Graduation # is 4, High School Graduation # is 5, University Graduation # is 6.

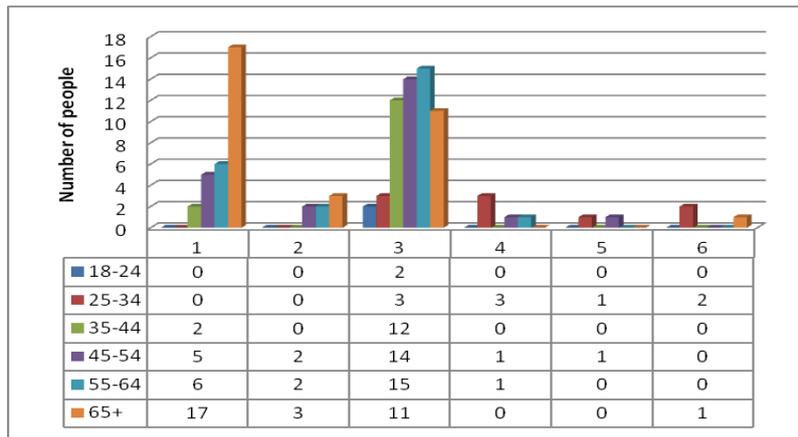


Figure 6. Education by Age.

A large part of Ayvacik people are engaged in farming. Even though some villages are livestock farmers, the number of people who go to rural villages as daily agricultural workers is high. A large part of the people living in Ayvacik villages continue their lives with a price that is far below the minimum wage. Most people work in non-insured everyday agricultural jobs, and Ayvacik feels more about the material effects of the earthquake.

Sampling asked questions such as "Do you own the house you live in?" And "Did you suffer damage in the Ayvacik earthquake?". According to a large majority of the findings obtained, the house where the sample lives is owned by itself (Chart 8). Those who do not own it live on rent, at the person's home, or in your home. The majority of these houses were damaged in the earthquake

Given the current situation of the houses, the sum of the cases of Debris (14%) and Heavy Damaged (52%) is a large majority. According to findings observed in the area, the houses destroyed are stone houses and the average age of the houses is 40-50 years. On the other hand, lightly damaged houses have been renovated with newer and later simple strengtheners, and most of the undamaged houses are newer ones.

The Ministry of Environment and Urbanism sent experts for the purpose of determining damage after the earthquake. The houses affected by the earthquake were examined and recorded as a reference to future transactions such as home aid and financial aid. Are you aware of the damage assessment report of the Ministry of Environment and Urbanism? " questioned. According to the responses, 43% (45 people) say YES, while 57% (59 people) say NO (Table 7).

Table 7. Being aware of the damage assessment report.

	FREQUENCY	%
YES	45	% 43
NO	59	% 57
TOTAL	104	% 100

The following table is obtained by comparing the damaged house and the damage situation. When you look at the damaged houses of the participants; 26 households (25%) were slightly damaged, 54 households (52%) were heavily damaged, and 15 households (14%) were detained.

Participants were asked: 'Is your house damaged?' When you say yes, 91% say no, 9% say no. 16% of homes are damaged, 57% are severely damaged, and 27% are slightly damaged.

Table 8. Comparison of home damage / damage situation questions.

HOUSE DAMAGE STATUS						
YOUR HOME IS DAMAGED		UNDAMAGED	LITTLE DAMAGED	HEAVY DAMAGED	RUINED	TOTAL
	YES	0	26	54	15	95
	NO	9	0	0	0	9
TOTAL		9	26	54	15	104

After the Ayvacık Earthquake, AFAD has made some studies in the region. One of them is the new home made to the people of the region. Participants were affected by the earthquake " Are you going to benefit from the housing benefit of AFAD " if it is heavily damaged or it is ruined? More than half of the respondents (59%) will benefit from housing assistance as they provide the necessary conditions.

41% of the sample that could not benefit from the housing assistance was asked how to make their next stay. Most of them have stated that they will make a renovation or a new house on their own. Many have stated that they either do not know how to stay in the damaged house or how to keep their life because they can not provide the necessary conditions. The general financial situation of the people of the region is the biggest influence.

Beside the house where some of the participants lived; Other immovable properties such as stables (59%), dam (34%), warehouse (5%) and workplace (2%) were also damaged.

After Ayvacik earthquake, there are many organizations coming to help the region. AFAD (33%), Kızılay (26%), Çanakkale Municipality (16%) and Governorship (14%) are the most prominent institutions. In addition to this, besides the provincial and district municipalities, companies such as İÇDAŞ and GESTAŞ have come from the Ministry of Environment and Urban Planning, Forestry Directorate, doctors' groups and some party organizations.

It has been learned that after the earthquake, the news and the help of the AFAD chair in the light of the meeting reached the people of the region immediately after the earthquake. The answers received from the question of the time of reaching the sample support this situation. According to this, a large majority (72%) of the sample said that the benefit reached within the first six hours. According to the information obtained, within the first six hours after the earthquake, the area was scanned by AFAD with the help of the Drone aircraft. As a result of the survey, the damage situation in the villages has been determined. According to the damage order, priority is given to help from heavy to light damage. It is thought that the answers to the questionnaire outside the first six hours from the sample were obtained by looking at the order of urgency after the air scan.

This is also supported when the residences of the participants are taken into consideration. According to this, the villagers who gave the answer "relief reached within the first six hours" were actually Babakale, Gülpınar, Tuzla, Yukarıköy, Çamköy and Taşağıl villagers who experienced the most severe depression results.

After the earthquake, the institutions and organizations that came to the region were assisted by earthquake survivors. At the same time, 29% of respondents who gave more than one help gave food, 23% clothes, 15% place (tent-container) and 13% fresh water. In addition, the gendarmerie established a temporary police station and secured the security of the zone (7% security). At the same time, the Department of Forest Affairs kept the area under control against the possibility of a fire in containers. AFAD coordinated the region by establishing crisis tables in the region after the earthquake. The General Directorate of Social Assistance provided 1,500 TL for the victims whose homes were mildly damaged and up to 3,000 TL for the heavy damage (6% of the money). In the

villages such as Koyunevi and Çamköy, the students were sent to Ayvacık center by means of a transported education system to continue their education (4% education). Health teams gave health services (1% health) to the earthquake victims in the region. In addition, toilet-bathrooms and laundry facilities are established. After the disaster, heaters and blankets were distributed to protect the earthquake victims from cold weather conditions (1% heaters / blanket). There were also those who stated that they did not receive any help because they did not need it (1% did not receive help).

The level of competence of participating institutions and organizations was asked and 58% of respondents were satisfied with yes, 14% with insufficient and 28% with partially satisfactory answers.

Since the question "Are you going to take advantage of AFAD 's housing benefit?" was an optional question, participants who did not have the house damaged indicated that they did not benefit from housing assistance. This is reflected in the table as a total of 9 lost values during registration. 59% of the participants stated that they would benefit from AFAD 's housing benefit. When the 61 participants (59%) who are going to benefit from the housing benefit are examined for their sufficiency, It is seen that 58% (34 people) is enough for the help, 22% (13 people) is partially sufficient and 20% (12 people) is not enough. When 43 respondents (49%) who did not receive housing assistance from AFAD were examined; it is seen that 58% (21 people) of the help is enough, 39% (14 people) is partially sufficient and 3% (1 person) is not enough

When the answer to the question "whether they get the housing assistance from the AFAD" and "whether they found the housing aids sufficient" is examined at the same time (cross table), the assistance of the residents of AFAD as well as the residents are insufficient (14%) (28%) are noteworthy.

When we look at the results, it can be said that various factors are effective on the stated attitude. As a matter of fact, it is seen that the participants have a great deal of desire from the institutions and organizations that provide assistance and in some cases they have really far-reaching expectations. The second important factor is the lack of coordination. In the distribution of the aid made, some people were assisted in the authorized and non-specialized local people. In this case, self-interest conflicts and encouragement of distributors can arise. As a result, it did not reach the people of the whole region due to both the lack of coordination and the lack of aid according to the needs analysis.

Another reason is the extension of the construction period required by the legislation of the houses being constructed by TOKİ under the coordination of AFAD. The fact that the living spaces of the participants who continue to stay in the container are adversely affected by the climatic conditions, affects the satisfaction of the sample in the negative direction.

Participants were asked to score on the aids made so that satisfaction levels were tried to be measured statistically. A score of 10 indicates the highest satisfaction score, while a score indicates the lowest dissatisfaction score. In addition, 10 participants (9.6%) did not want to answer this question, which is shown as missing value on the tabllara. 33.7% of participants gave 10 points, 1% gave one point. When the results were evaluated, it was noted that 19.6% of the participants gave a score between 1 and 5 and 71.2% gave a score between 6 and 10. Taking into account that the arithmetic average of the points is 7.05, it can be deduced that the participants are generally satisfied with the help made.

Participants, at the end of the questionnaire survey, "how else could they be helped other than the help made?" questioned. Accepted answers; infrastructure needs, education, coordination problem, health and financial desires. According to the participants' wishes can be listed as follows:

Infrastructure;

- Because of the lack of clean water in the region after the earthquake,
- requests for repair services of earthquake victims whose homes are lightly damaged,
- long-term inter-continental sewerage problems in containers,
- some villagers are inadequate due to the fact that the toilet is out of the bathroom container and the participants in these villages are more likely to have infrastructure needs such as bathrooms, toilets,

Coordination;

- bringing various aid to the village center, the elderly and disabled who can not reach it,
- lack of expertise during the distribution of benefits,
- not to be notified to all earthquake victims during the aid,

Health;

- the desire of the health teams to give priority to the disabled and elderly people due to the inability of health benefits to reach the bedridden victims,
 - Due to the inadequacy of health personnel and services,
 - health needs such as cordless cars, earthquake victims with disabilities,
- education;
- The lack of teachers due to lack of space for future teachers
 - Educational wishes such as the unopened and inadequate time of the container schools;

Material;

- Financial aid requests of non-residents during the financial assistance,
- Having financial needs such as extra money help considering the number of children who have financial aid but have children as earthquake victims.

4. CONCLUSION

After the Ayvacık earthquake which caused the material and spiritual destructions, some institutions and organizations have made various studies to reduce the negative effects of depression on the victims and to continue the sustainable life. As an example; Provincial Directorate of Agriculture provides animal assistance to the victims who died during the earthquake, financial aid provided by the General Directorate of Social Assistance, AFAD 's general coordination of the post - disaster area, various health services from the health teams, aid services, However, some of the services and work done in the region during our study were found to have serious coordination deficiencies. Some of the victims were not aware of the help during their aid, so they were not able to benefit from the animal and financial benefits; it was seen that the health teams from the region could not reach some elderly and bedridden victims because all the earthquake victims were not able to benefit from the aid on the grounds that the parcels and apparel benefit aids were distributed in the village square and the necessary disasters were not received from them. In some cases it has been learned that aid workers in this context have received assistance from some local people from the villagers, but this has caused various conflicts of interest and encouragement. Especially during the damage assessment, some houses were not shown because the houses were not displayed, so the duration of these works is extended. It is believed that the specialist situation in this area is caused directly or indirectly by the delay of the houses to be built.

Local residents have been informed by the relevant staff about the housing assistance and other work to be done but there has been insecurity in the damage assessment and housing assistance of AFAD and this has been delayed especially in the residence applicants. When the level of education in the vicinity is taken into account, the necessary disclosures of the AFAD staff are not well

understood, so it is seen that the houses are not built and even the delays meet some kind of fear of fraud. AFAD has started to install containers within two days after the Ayvacık earthquake and there is a sewage problem over time in these containers, so more attention should be paid to the sewage system before the containers are installed. During the field work empty containers were encountered. Participants stated that they encounter foreigners in the region. For this reason, it is considered to be safe from the point of view that unused containers must be removed. The duration of the construction of the dwellings to be built by AFAD is therefore extended, which means that metal containers with disasters will be adversely affected by weather conditions. Simple modifications are still being made for the container because of the extreme cold in the summer months and the extreme cold in the winter months.

According to the result from this study, education and training activities containers continue in school, and at the same time, some of the villages have been trained to carry on the important steps of the normalization of the normalization of the disaster again. Finally, because of the lack of toilet baths, containers with wc bathrooms should be used more frequently, earthquake victims should be informed more about the construction and the right of ownership of AFAD houses and the shortcomings of the organization should be resolved shortly.

REFERENCES

- AFAD, 2017. 12.02.2017 Ayvacık-Çanakkale Earthquake Report (in Turkish).
- Aktug, B. and Kilicoglu, A., 2006. Recent crustal deformation of Izmir, western Anatolia and surrounding regions as deduced from repeated GPS measurements and strain field. *J. of Geody.*, 41, 471-484.
- Coe J.A., Ellis W.L., Godt J.W. , Savage W.Z., Savage J.E., Michael J.A., Kibler J.D., Powers P.S., 2003. Lidke D.J., Debray S., Seasonal Movement of the Slumgullion Landslide Determined from Global Positioning System Surveys and Field Instrumentation, July 1998–March 2002, *Engineering Geology*, 68, 67–101.
- Duman, T., Çan, T., Emre, Ö., Kadiroğlu, F.T., Baştürk., N.B., Kılıç, T., Arslan, S., Özlap, S., vd. (2016). Seismotectonic database of Turkey. *Bull Earthquake Eng.* 1-40, doi:10.1007/s10518-016-9965-9.
- IGS: The International GNSS Service. <http://igsb.jpl.nasa.gov/>
- KRDAE, 2017. Boğaziçi Üniversitesi Kandilli Rasathanesi ve Deprem Araştırma Enstitüsü, <http://koeri.boun.edu.tr>
- Özalp, S., Emre, Ö., & Doğan, A. 2013. The segment structure of southern branch of the North Anatolian Fault and paleoseismological behaviour of the Gemlik Fault, NW Anatolia. *General Directorate of Mineral Research and Exploration (MTA) Bulletin*, 147, 1–17.
- Özden, S., 2017, Ayvacık Depremleri Üzerine Değerlendirme Paneli, 9 Mart 2017, Çanakkale.
- Sözbilir, H. vd., 2017, 14 Ocak - 28 Şubat 2017 Çanakkale - Ayvacık Depremleri ve Bölgenin Depremselliği, Dokuz Eylül Üniversitesi Deprem Araştırma ve Uygulama Merkezi Diri Fay Araştırma Grubu, 22 sayfa.

Authors:

R. Cuneyt Erenoglu, Assoc. Prof. Dr.

Canakkale Onsekiz Mart University,
Faculty of Engineering,
Dept. of Geomatics Engineering
17100, Canakkale, Turkey
Tel: + 90 286 218 00 18
E-mail: ceren@comu.edu.tr

Oya Erenoglu, Assist. Prof. Dr.

Canakkale Onsekiz Mart University,
Faculty of Education
Department of Geography Education
17020, Canakkale, Turkey.
Tel: +90 (286) 218 00 18 (ext. 3643)
E-mail: o_turkdonmez@comu.edu.tr