



**AN INVESTIGATION OF THE DIFFERENCES IN EARTHQUAKE
RESISTANCE POLICIES IN TURKEY AND JAPAN THROUGH
ARCHITECTURE ETHICS**

**A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES
OF
GAZİ UNIVERSITY**

BY

Mustafa DALLI

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR
THE DEGREE OF MASTER OF SCIENCE
IN
ARCHITECTURE**

DECEMBER 2022

ETHICAL STATEMENT

I hereby declare that in this thesis study I prepared in accordance with thesis writing rules of Gazi University Graduate School of Natural and Applied Sciences;

- All data, information and documents presented in this thesis have been obtained within the scope of academic rules and ethical conduct,
- All information, documents, assessments and results have been presented in accordance with scientific ethical conduct and moral rules,
- All material used in this thesis that are not original to this work have been fully cited and referenced,
- No change has been made in the data used,
- The work presented in this thesis is original,

or else, I admit all loss of rights to be incurred against me.

Mustafa DALLI

27/12/2022

AN INVESTIGATION OF THE EARTHQUAKE RESISTANCE POLICIES IN TURKEY
AND JAPAN THROUGH ARCHITECTURE ETHICS

(M. Sc. Thesis)

Mustafa DALLI

GAZİ UNIVERSITY

GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES

December 2022

ABSTRACT

Disasters are natural events that directly or indirectly affect human life and result in loss of life and property. Architecture, on the other hand, has been one of the most influential professions in the reconstruction process in disasters, which is encountered as the oldest profession in ancient history. In time, with the addition of the concept of pre-disaster to the literature together with post-disaster reconstruction, the responsibilities of the architectural profession towards society have also expanded. Professional ethics is a concept that regulates these responsibilities. And in this two-stage study, firstly, the architectural professional ethical codes published by the architectural organizations of the countries were examined with the document analysis method and it was tried to determine how much of these words exist related to the disaster. In the second stage, the earthquake histories of Japan and Turkey, which have a common disaster history, and their approaches to earthquakes were examined with the comparative analysis method and the differences were tried to be determined. An attempt has been made to form a basis for further studies.

Science Code : 80120d

Key Words : Earthquake Resistance, Architectural Professional Ethics, Earthquake Codes, Disaster Management System, Seismicity of Japan and Turkey

Page Number : 114

Supervisor : Assist. Prof. Dr. Asena SOYLUK

TÜRKİYE VE JAPONYA'DA DEPREME DAYANIM POLİTİKALARINDAKİ
FARKLILIKLARIN MİMARLIK ETİĞİ ÜZERİNDEN İNCELENMESİ

(Yüksek Lisans Tezi)

Mustafa DALLI

GAZİ ÜNİVERSİTESİ
FEN BİLİMLERİ ENSTİTÜSÜ

Aralık 2022

ÖZET

Afetler, insan yaşamını doğrudan veya dolaylı olarak etkileyen, can ve mal kaybıyla sonuçlanan doğal olaylardır. Mimarlık ise antik tarihin en eski mesleği olarak karşımıza çıkan afetlerde yeniden yapılanma sürecinde en etkili mesleklerden biri olmuştur. Zaman içinde afet sonrası yeniden yapılanma ile birlikte afet öncesi kavramının da literatüre eklenmesiyle mimarlık mesleğinin topluma karşı sorumlulukları da genişlemiştir. Meslek etiği ise bu sorumlulukları düzenleyen bir kavramdır. İki aşamalı bu çalışmada ise, öncelikle ülkelerin mimarlık kuruluşları tarafından yayınlanan mimarlık mesleği etik kodları doküman incelemesi yöntemiyle incelenmiş ve afetle ilgili bu kelimelerin ne kadarının bulunduğu tespit edilmeye çalışılmıştır. İkinci aşamada, ortak bir afet geçmişine sahip olan Japonya ve Türkiye'nin deprem geçmişleri ve depremlere yaklaşımları karşılaştırmalı analiz yöntemi ile incelenmiş ve farklılıklar tespit edilmeye çalışılmıştır. Bundan sonraki çalışmalara temel teşkil edilmeye çalışılmıştır.

Bilim Kodu : 80120d

Anahtar Kelimeler : Deprem Dayanımı, Mimari Meslek Etiği, Deprem Yönetmeliği, Afet Yönetim Sistemi, Japonya ve Türkiye Depremselliği

Sayfa Adedi : 114

Danışman : Doç Dr. Asena SOYLUK

ACKNOWLEDGEMENTS

Disasters are natural events that affect human life and leave consequences that may change them forever. And architecture, as one of the oldest professions in history, is a field that has direct and indirect effects on societies and people. In this sense, what I want to achieve in this study is to question the relationship between professional ethics and disaster, and to contribute to the literature and our society with an optimistic approach by comparing Japan as an important example and our country.

I would like to express my endless thanks and love to my dear mother Füsün Dallı, my father Hüseyin Dallı, my grandmothers Emine Kardaş ve Emine Dallı and my aunt Müfide Kardaş, who have always been by my side during this difficult process, who have never spared me their financial and moral support, and who have motivated me by taking care of every step closely. I present my love and respect to Asst. Prof. Dr. Asena Soyluk, my valuable advisor, who never spared me her motivation, supports and knowledge during my work and whom I am grateful to have met.

Finally, I convey my wishes to the people who lost their lives in all disasters to "rest in peace" and send my condolences to the people who lost their loved ones.

TABLE OF CONTENTS

	Page
ABSTRACT.....	iv
ÖZET	v
ACKNOWLEDGEMENTS.....	vi
TABLE OF CONTENTS.....	viii
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF MAPS	xii
SYMBOLS AND ABBREVIATIONS	xiii
1. INTRODUCTION	1
1.1. Background and Problem Definition	1
1.2. Research Aims	3
1.3. Research Questions.....	5
1.4. Research Hypothesis	5
1.5. Research Plan	6
2. LITERATURE REVIEW	9
2.1. Natural Disasters.....	9
2.1.1. Global impact of natural disasters	10
2.1.2. Disaster management and architecture	13
2.2. Codes of Ethics of Professions	14
2.2.1. Professional ethics	14
3. ARCHITECTURAL CONSCIOUSNESS IN NATURAL DISASTER: CASE STUDY ETHICAL CODES OF ARCHITECTURE IN DISASTER AND COMPARISON OF ARCHITECTURAL CONSCIOUSNESS OF JAPAN AND TURKEY IN EARTHQUAKE RESISTANT BUILDING DESIGN	19

	Page
3.1.Methodology	19
3.2. Limitations	21
3.3. Results.....	22
3.3.1. The word “disaster”	22
3.3.2. The word “welfare”	25
3.3.3. The word “health”	28
3.3.4. The word “safety”	32
3.3.5. The word “security”	40
3.3.6. Discussions	44
3.4. Comparison of Architectural Consciousness of Japan and Turkey in Earthquake Resistant Building Design	49
3.4.1. Seismic history of Turkey and Japan.....	50
3.4.2. Building/earthquake codes change in Japan and Turkey	70
3.4.3. Disaster management.....	81
3.4.4. Disaster management in Japan.....	82
3.4.5. Disaster management in Turkey	85
3.5. Role of Disaster Education in Japan and Turkey	91
4. EVALUATIONS	93
5. RESULTS.....	101
REFERENCES.....	99
RESUME.....	113

LIST OF TABLES

Table	Page
Table 2.1. Effects of Natural Disasters in the 1980-2019, 2020 & 2021	11
Table 2.2. Summary Statistics of Ten Countries Most Affected Economically by Disasters in 2021.....	12
Table 3.1. Examined Architectural Professional Ethics Codes and Distribution of Five Words	45
Table 3.2. The number of deaths, injuries and damage in Nobi Earthquake	52
Table 3.3. The number of deaths, injuries and damage in Great Kantō_Earthquake	53
Table 3.4. The number of deaths, injuries and damage in Fukui Earthquake	54
Table 3.5. The number of deaths, injuries and damage in Tokachi-Oki Earthquake	56
Table 3.6. The number of deaths, injuries and damage in Miyagiken-Oki Earthquake	56
Table 3.7. The number of deaths, injuries and damage in Great Hanshin Earthquake.....	58
Table 3.8. The number of deaths, injuries and damages in Great East Japan Earthquake ..	60
Table 3.9. The number of deaths, injuries and damages in Erzincan Earthquake	61
Table 3.10. The number of deaths, injuries and damages in Bolu Earthquake	63
Table 3.11. The number of deaths, injuries and damages in Varto Earthquake	63
Table 3.12. The number of deaths, injuries and damages in Lice Earthquake	64
Table 3.13. The number of deaths, injuries and damages in Marmara Earthquake.....	66
Table 3.14. The number of deaths, injuries and damages in Van Earthquake.....	67
Table 3.15. The number of deaths, injuries and damages in Elazığ Earthquake	68
Table 3.16. The number of deaths, injuries and damages in İzmir Earthquake	69
Table 3.17. Building and Earthquake Changes in Japan	70
Table 3.18. Building and Earthquake Changes in Turkey	75
Table 4.1. Comparison of Architectural Consciousness of Japan And Turkey in Earthquake Resistant.....	96

LIST OF FIGURES

Figure	Page
Figure 1.1. Flowchart of the parts of the study	4
Figure 2.1. Classification of natural hazards with examples of events and peril/harm for each category	10
Figure 2.2. The Disaster Management Cycle.....	13
Figure 3.1. Percentage distribution of the word "disaster"	24
Figure 3.2. Percentage distribution of the word "welfare"	27
Figure 3.3. Percentage distribution of the word "disaster"	32
Figure 3.4. Percentage distribution of the word "safety"	39
Figure 3.5. Percentage distribution of the word "security"	44
Figure 3.6. Percentage distribution of the 5 words overall	47
Figure 3.7. Nagara Gawa railway bridge after 1891 Nobi Earthquake	52
Figure 3.8. Damage of new brick factory after 1891 Nobi Earthquake	53
Figure 3.9. Metropolitan Police Office after the 1923 Great Kanto Earthquake	54
Figure 3.10. Daiwa Department Store After The Fukui Earthquake	55
Figure 3.11. Daiwa Department Store After The Fukui Earthquake	55
Figure 3.12. A Damage image from 1968 Tokachi-Oki Earthquake	56
Figure 3.13. Obisan Building, Damage from 1978 Miyagi Ken-Oki Earthquake	57
Figure 3.14. Paloma Building, Damage from 1978 Miyagi Ken-Oki Earthquake	57
Figure 3.15. Yazaki Industries, Damage from 1978 Miyagi Ken-Oki Earthquake	58
Figure 3.16. Collapsed Wooden Building in 1995 in Great Hanshin Earthquake	59
Figure 3.17. Collapsed Wooden Building in 1995 in Great Hanshin Earthquake.....	59
Figure 3.18. Destroyed buildings picture due to the 2011 Great East Japan Earthquake....	60
Figure 3.19. A Damage image from 2011 Great East Japan Earthquake	61
Figure 3.20. Damage from 1939 Erzincan Earthquake.....	62

Figure	Page
Figure 3.21. Damage from 1939 Erzincan Earthquake.....	62
Figure 3.22. Damage from 1944 Bolu Earthquake	63
Figure 3.23. Regional Hospital Building after 1966 Varto Earthquake	64
Figure 3.24. Completely Destroyed Police Building in 1975 Lice Earthquake.....	65
Figure 3.25. Totally Collapsed Building in 1999 Marmara Earthquake.....	65
Figure 3.26. Tilted Building in 1999 Marmara Earthquake.....	66
Figure 3.27. Collapsed Building in 1999 Marmara Earthquake	66
Figure 3.28. Collapsed Building in 2011 Van Earthquake	67
Figure 3.29. Collapsed Building in 2020 Elazığ Earthquake.....	68
Figure 3.30. Collapsed Building in 2020 İzmir Earthquake	69
Figure 3.31. Collapsed Building in 2020 İzmir Earthquake	69
Figure 3.32. Outline of Japan's disaster management system	81
Figure 3.33. Outline of Earthquake Early Warning System	85
Figure 3.34. Disaster Management System Before 2009	88
Figure 3.35. Turkey's Disaster Management Planning Approach	90
Figure 3.36. Locations of Istanbul Earthquake EU Stations	91
Figure 3.37. Comparison chart of Japan and Turkey's architecture schools' curriculum content	92

LIST OF MAPS

Maps	Page
Map 3.1. Distribution of the word "disaster" on the world map	23
Map 3.2 Distribution of the word "welfare" on the world map	25
Map 3.3. Distribution of the word "health" on the world map	28
Map 3.4. Distribution of the word "safety" on the world map	32
Map 3.5. Distribution of the word "security" on the world map	40
Map 3.6. Map of Pacific Ring of Fire	50
Map 3.7. Earthquake Hazard Map of Turkey	51
Map 3.8. Distribution map of seismic intensity of earthquake under southern Tokyo	84

SYMBOLS AND ABBREVIATIONS

The symbols and abbreviations used in this study are presented below along with their explanations.

Symbols	Descriptions
Km	Kilometer
Km	Square Kilometers
Mw	Moment Magnitude
Md	Duration Size
Abbreviations	Descriptions
AANB	Architects' Association of New Brunswick
AAPEI	Architects' Association of Prince Edward Island
AFAD	Disaster and Emergency Management Authority
AIA	American Institute of Architects
AIJ	Architectural Institute of Japan
APBSA	Architectural Practice Board of South Australia
BAPEQS	Board of Arch., Prof. Eng. and Quantity Surveyors
A&DS	Architecture and Design Scotland
CAE	National College of Architects of Ecuador
CAU/BR	Conselho de Arquitetura e Urbanismo do Brasil
CCA	Croatian Chamber of Architects
CCE	Czech Chamber of Architects
CSCAE	Superior Council of the Colleges of Arc. of Spain
CNAPPC	Nat. Council of Arch., Plan., L. Architects and Cons.
DRR	Disaster Risk Reduction
EEW	Earthquake Early Warning
EM-DAT	Emergency Events Database
IAI	Indonesian Institute of Architects
JICA	Japan International Cooperation Agency
JMA	Japan Meteorological Agency

Abbreviations	Descriptions
JST	Japan Science and Technology Agency
MEK	Hungarian Chamber of Architects
METU	Middle East Technical University
NZRAB	New Zealand Registered Architects Board
NIA	Nigerian Institute of Architects
OAI	Order of Architects and Consulting Engineers
OAQ	Ordre des architectes du Québec
OECD	Organisation for Economic Co-Operation and Dev.
PRC	Philippines Professional Regulation Commission
RAIA	Royal Australian Institute of Architects
RAIC	Royal Architectural Institute of Canada
RIBA	Royal Institute of British Architects
SACAP	South African Council for The Arch. Profession
SSJ	Seismological Society of Japan
SSO	The Statutes of The Republic of Singapore
USA	United State of America
USGS	United States Geological Survey
UK	United Kingdom
TAMP	Turkish Disaster Response Plan
TARAP	Turkey Disaster Risk Reduction Plan
TAYSB	Turkey Disaster Management Strategy Document
TİKA	Turkish Cooperation and Coordination Agency
ZAPS	Chamber of Arch. and Spatial Planning of Slovenia

1. INTRODUCTION

1.1. Background and Problem Definition

Throughout history, many events have occurred that have threatened the existence of humanity on earth. One of them is natural disasters. Natural disasters, such as earthquakes, floods, avalanches, tsunamis, and hurricanes, are natural events that seriously affect the safety of life and property of people and even communities. Natural disasters affect societies physically and sociologically and countries economically.

The concept of ethics on the one hand is a branch of philosophy that investigates the values, norms, rules that form the basis of individual and social relations that people establish, from a moral point of view such as right-wrong or good-bad. Professional ethics on the other hand, deals with the right and wrong behaviors that prevail in a particular profession. Honesty in all professional relationships requires keeping one's word, being respectful to nature and people, acting fairly and opposing injustices.

On the other hand, since the architectural profession is directly related to people's lives, it is inevitable that there will be articles related to the welfare, health and safety of the society as well as to the architects' colleagues or each other, or to project construction, in the ethical rules set by the professional chambers.

Because today, as seen in the most destructive natural disasters, professions that are directly related to the concept of "built environment" such as civil engineering, city planning and architecture have a great importance on issues such as reducing these destructive disasters and their effects, disaster moments or post-disaster recovery. The architectural profession, which has existed since the beginning of history, differs from these professions in that the design phase of "built environment" belongs to them.

Countries have developed systems called "disaster management", covering all levels that affect the functioning of the society, in order to combat disasters and in order to maintain their function during and after the disaster. When the disaster management systems and plans of the three countries are examined, it is seen that pre-disaster, disaster situation and post-disaster planning are important for all three countries for measures taken against disasters.

Architecture and architects have important roles in risk and safety assessment, disaster risk reduction, disaster preparedness and pre-disaster planning, and emergency relief.

Earthquakes are one of the natural disasters that have caused the greatest damage to people, countries and geographies since the beginning of humanity. The United Nations defines a disaster as the serious destruction of the functioning of a community or society. Earthquakes, on the other hand, include widespread human, financial, environmental and economic effects (Mermer, Donmez, & Daghan, 2018). While these effects can be seen in a lesser way in some earthquakes, they can reach destructive dimensions in some earthquakes. Some countries and geographies, on the other hand, face more earthquakes and destructive consequences than others, with their proximity to active fault lines. Countries located on active fault lines are faced with many earthquakes of varying magnitude in regular periods.

Living with an earthquake also brings many problems and facts. These are concepts that countries should take measures and work on such as earthquake-resistant building design, disaster management, regulations, preparedness, education and technological developments. Architecture plays a very important role here in the context of the "built environment". Because many studies have shown that most of the defects encountered in earthquakes are caused by the decisions taken at the architectural design stage.

As a result of the findings obtained in the field study, the differences between Japan, which were seen to determine a holistic and effective approach to earthquakes and Turkey were examined in the study. Because Japan and Turkey have gone through a similar history in terms of disaster type, destruction and losses.

Japan and Turkey are among the main countries on the world agenda when it comes to earthquakes. Although the characteristics and magnitudes of the earthquakes they encountered are different from each other, it can be said that they have a common destiny in terms of being in a geography that requires them to live with the concept of earthquakes and in terms of the destruction experienced. For example, one-tenth of the world's earthquakes occur in and around Japan. An average of one M7 earthquake occurs in Japan each year. It has been frequently exposed to earthquake disasters since ancient times. (Matsu'ura, 2017).

On the other hand, Turkey is located in one of the world's most active seismic regions and a large part of the country is at risk of a major disaster (Bommer et al., 2002). In the list provided by the American Geological Research Foundation; Approximately 6% of the number of earthquakes in world history took place in Turkey (Bikçe, 2015).

However, apart from the characteristics and magnitudes of earthquakes, it can be said that these two countries are quite different from each other in terms of earthquakes. They differ from each other especially when it comes to measures taken, seismic history, regulations developed, disaster management, disaster preparedness, education, technologies developed and used, and lessons learned from earthquakes.

In summary, in this study, the architectural profession and the ethical relationship, which is primarily related to the concept of building-human, architectural profession ethical codes of 51 countries were examined. As a result of the findings, the differences between Japan, which is the only country that includes the concept of disaster and uses it literally in its code, and Turkey, which does not use the word disaster despite experiencing similar losses, are examined through the common disaster, earthquake disaster. The differences between the two countries were tried to be determined by examining their earthquake history, losses and developments after the earthquakes.

1.2. Research Aims

The destructiveness of natural disasters shows itself again and again in every natural disaster. Countries trying to cope with this destructive effect take lessons after natural disasters and work to prepare themselves and their society for the next one. They are trying to develop in this sense by focusing on issues directly related to natural disasters, such as the importance of disaster management, pre and post disaster works.

On the other hand, as mentioned in the introduction, it is of great importance that architects play an active role in these works. This profession, which has a responsibility to the society, should also have a section prepared for disasters in the Professional ethics codes. Because the most important task of an architect is to be aware of the fact that human life and safety are the most important parameters in all conditions in the designs, he/she will make.

The study consists of two parts. In the first part, architectural professional ethical codes published by architectural organizations of 51 countries were examined. The five selected words (disaster, welfare, health, safety, security) were examined in these codes. The aim of the first part of the study is to investigate the words "disaster", "welfare", "health", "security" and "safety" selected in the ethical codes published by the professional chambers of architecture from around the world and on top of that, the relationship between these words in ethical codes and disaster approach (disaster management systems, building codes, awareness) of countries is questioned.

In the second part of the study, a comparison was made over the earthquakes, which are common disasters between Japan and Turkey, based on the findings. The purpose of the second part is to make a comparison between a country that is in a better position in terms of approach to disaster and Turkey, and to determine which issues there are deficiencies.

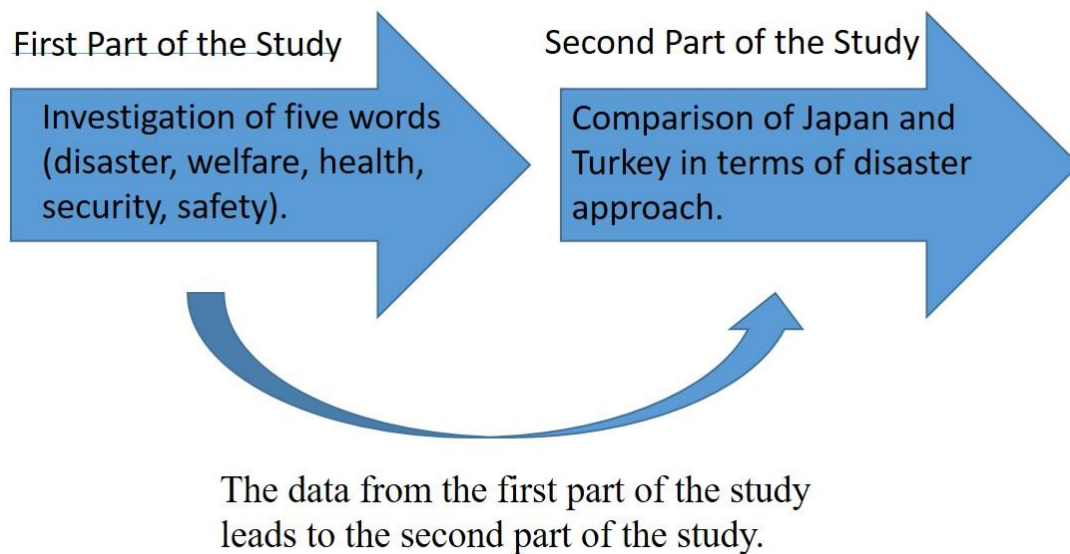


Figure 1.1. Flowchart of the parts of the study

The aim of the study is to understand how the disaster management systems of the countries where the words such as disaster, health, safety, welfare and security are selected in the architectural ethical codes and to examine how active the architects are in this management system. It is to evaluate the differences between Japan, which is considered an example in disaster subjects, and Turkey, which has made progress in this sense.

1.3. Research Questions

In this study, the ethical codes of the chambers of architecture of fifty-one countries were examined. And by comparing Japan and Turkey on the findings obtained, the effects of earthquake and disaster management policies and the differences between the two countries were examined. The following research questions has been the main focus of the study:

- What is the relationship between the better situation of countries in disaster and disaster management and the fact that the word “disaster” is directly or indirectly included in the architectural ethical codes of the countries?
- What are the important differences between Turkey and Japan in terms of disaster management policy and measures taken after major earthquakes?

To achieve the answer to this question, the following sub-questions was also searched:

- How and to what extent is the concept of disaster integrated into professional ethical codes published by architectural organizations?
- How important is disaster management for recovery after an earthquake?
- What is the role of architecture in disaster and disaster management?

1.4. Research Hypothesis

The research was conducted to test the following hypothesizes,

- The inclusion of the word "disaster" in the architectural ethical codes of countries is closely related to the countries' disaster approach being more holistic and effective.
- Professional groups such as architecture, which are at the forefront of the building-human relationship, are important in terms of determining a more holistic and effective disaster approach in earthquake disaster countries.
- Japan's approach to disasters in general and Earthquake-Resistant Building Design is much better than Turkey's.

Research hypotheses were tested by investigation of architectural ethic codes of fifty-one countries and comparison of strategies of Japan and Turkey in the face of the earthquakes in.

1.5. Research Plan

In this study, from qualitative analysis method the document analysis and comparative research methods have been used, which makes it possible to approach the subject with a critical point of view, provides a clearer understanding of the subject and gives flexibility to the study with the data collection tools it contains. This study, which was conducted to examine the relationship between architectural professional ethics and disaster, and to examine the differences between Japan and Turkey, which is an important representation in terms of earthquake approach as a result of the findings, was carried out in the form of a research plan as follows:

In the first chapter, the definition of the problem, the purpose of the study, the questions of the study, the hypotheses of the study and the plan of the study were explained and the study was mentioned in general.

In the second part, the studies in the literature in the field of disaster, the global impact of the disaster, disaster management, disaster management systems, ethics, professional ethics, disaster ethics were examined and the deficiencies in the literature were tried to be determined by examining how and how the study took place in the literature.

In the third part, where the fieldwork is explained, the architectural profession ethical codes published by the architectural organizations of fifty-one countries (identified online) were examined, and which of the 5 selected words "disaster", "prosperity", "health", "safety" and "security" were used. and how they were used. As a result of the findings obtained from the field study, earthquakes, losses, changes in earthquake regulations, disaster management and changes, awareness-raising studies about earthquakes, namely earthquake approaches of the two countries in general, were examined and compared.

In the fourth part evaluations on the differences between Japan and Turkey. An objective comparison has been made in evaluations based on seismic histories, losses and reflexes

given in return, building code changes, disaster management systems, and disaster awareness.

In the fifth chapter, both the effect of the field study on the hypotheses and research questions, the evaluations on the differences between Japan and Turkey examined in the fourth part, the results of the comparison are compiled and how it will be a basis for the next studies is explained.

2. LITERATURE REVIEW

2.1. Natural Disaster

From the existence of the Earth to the present, there have been many devastating events that have shaped the Earth and threatened the existence of humanity in this world. One of these devastating events is natural disasters. Natural disasters began to occur long before humanity existed on the planet and will likely continue as long as Earth exists. Each of the natural disasters affects social life and human life physically, sociologically and economically. Natural disasters, such as earthquakes, floods, hurricanes, storms, forest fires, volcanic eruptions and landslides, are of natural origin and cause loss of life or property.

Research Center for the Epidemiology of Disasters (CRED): EM-DAT has determined four criteria to be able to talk about the existence of a natural disaster. The criteria are as follows (EM-DAT, 2014a).

- The death of at least 10 people,
- At least 100 people are affected,
- Declaring a state of emergency,
- Requesting international assistance.

In addition to the obvious direct effects of natural disasters, there are also many indirect effects. Although the indirect effects are not clearly seen, years of expenditure may be required to recover the damages of a disaster. It is not possible to eliminate the damages, and the hazards can change their lifestyles. Recognizing natural disasters is extremely important, as human activities can sometimes increase the severity and impact of natural hazards (Dallı and Soyluk, 2022a).

Natural disasters are generally classified into six categories as follows. It is shown in Figure 2.1 with examples of natural disasters divided into categories.

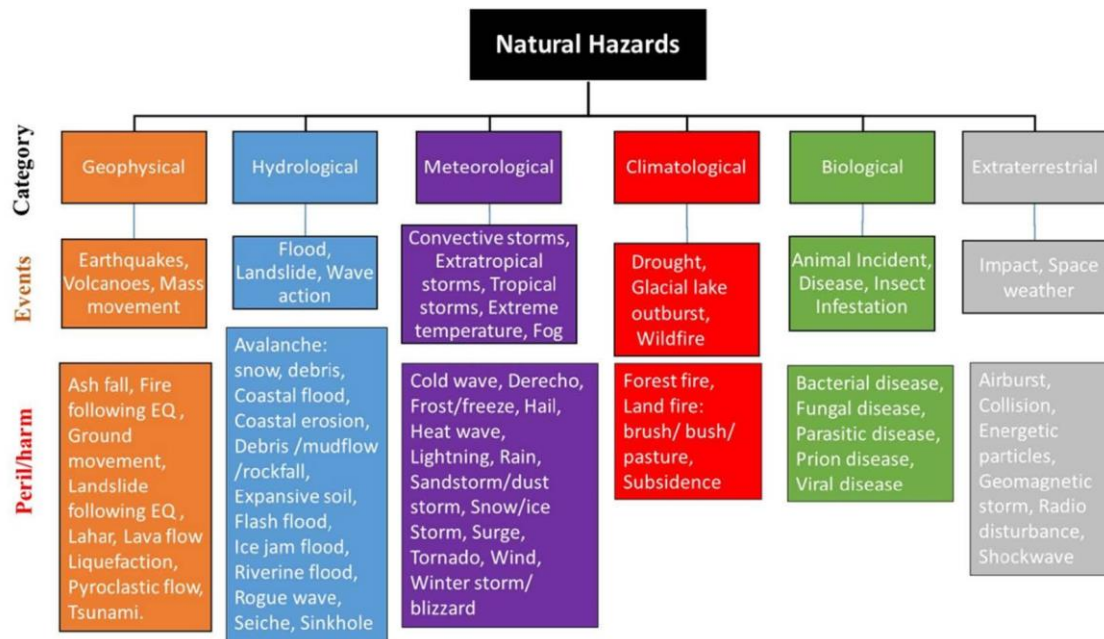


Figure 2.1. Classification of natural hazards with examples of events and peril/harm for each category (Chaudhary and Piracha 2021).

2.1.1. Global impact of natural disasters

Natural disasters have negative effects on people, societies and even economies. These effects leave many physical as well as non-physical effects. The main reason why countries take serious and effective measures against these disasters is loss of life and economic reasons. As seen in Table 1, while approximately 3 billion people lost their lives in the last 20 years due to disasters in the world in the last 25 years, the economic cost of these disasters is trillions of dollars (Dallı and Soyuk, 2022). Every day, 2 million dollars is spent for disasters such as floods, droughts, hurricanes and earthquakes, which are among the increasing disasters (Ersoy, 2006).

Table 2.1. Effects of Natural Disasters in the 1980-2019, 2020 & 2021 (CRED, 2019), (EM DAT, 2020&2021)

Years	Number of Natural Disasters	Number of Loss	Number of Affected People	Total Loss
1980-1999	4,212	1.19 billion	3.25 billion	1.63 trillion
2000-2019	7,348	1.23 billion	4.03 billion	2.97 trillion
2020	389	15,080	98.4 million	171.3 billion
2021	432	10,492	101.8 million	252 billion
Total	732,56	2.480.025.572	406.450.200.000	460,423,000,000,000

In addition to this situation, the measures taken by countries against disasters have also increased the heavy pressure on their economies. This shows that the work to be done on disaster risk reduction is now a more complex and difficult process (CRED, 2021).

In this sense, the ten most important disasters causing high life and economic losses in 2021 published by The Center for Research on the Epidemiology of Disasters (EM-DAT, 2021) are listed in Table 2.2. As can be seen in the table, the impact of disasters on developed economies is quite high. The most logical and effective solution to reduce this is to take effective measures before and after natural disasters. After the disaster, the renovation and reconstruction of the buildings damaged by the disaster is difficult, time consuming and costly. Therefore, renovation and reconstruction projects should be prepared and implemented by experienced professionals.

Table 2.2. Summary Statistics of Ten Countries Most Affected Economically by Disasters in 2021 (CRED, 2021).

Country	Type of Disaster	By Loss Amount (Billion USD)
<i>USA</i>	<i>Hurricane Ida</i>	<i>65</i>
<i>Germany</i>	<i>Flood</i>	<i>40</i>
<i>USA</i>	<i>Winter Storm</i>	<i>30</i>
<i>China</i>	<i>Flood</i>	<i>16.5</i>
<i>USA</i>	<i>Drought</i>	<i>9</i>
<i>Japan</i>	<i>Earthquake</i>	<i>7.7</i>
<i>France</i>	<i>Cold Wave</i>	<i>5.6</i>
<i>USA</i>	<i>Tornado</i>	<i>5.2</i>
<i>USA</i>	<i>Wildfire</i>	<i>3.3</i>
<i>China</i>	<i>Drought</i>	<i>3.1</i>
<i>USA</i>	<i>Storm</i>	<i>3.1</i>
<i>India</i>	<i>Flood</i>	<i>3.1</i>

As can be seen in Table 2.2., the ten disasters causing the highest economic losses in 2021 are listed, published by the Disaster Epidemiology Research Center (EM-DAT, 2021). As can be seen from the table, disasters have as much impact on developed economies as they do on undeveloped countries. The effective solution to reduce the devastating effects of disasters is to take effective measures before and after natural disasters.

Countries are under the risk and danger of encountering disasters, either directly or indirectly. For this reason, it is imperative that societies develop their skills to live with disasters and take precautions against disasters (Figure 2.2). In this context, disaster management systems have been developed to minimize the loss of life and property caused by disasters in the world. Because a well-developed disaster management system becomes the most effective solution in order to produce systematic and logical solutions to natural

disasters, to develop mechanisms for communities to cope with these disasters, and to overcome human and economic losses (World Disasters Report, 2009).

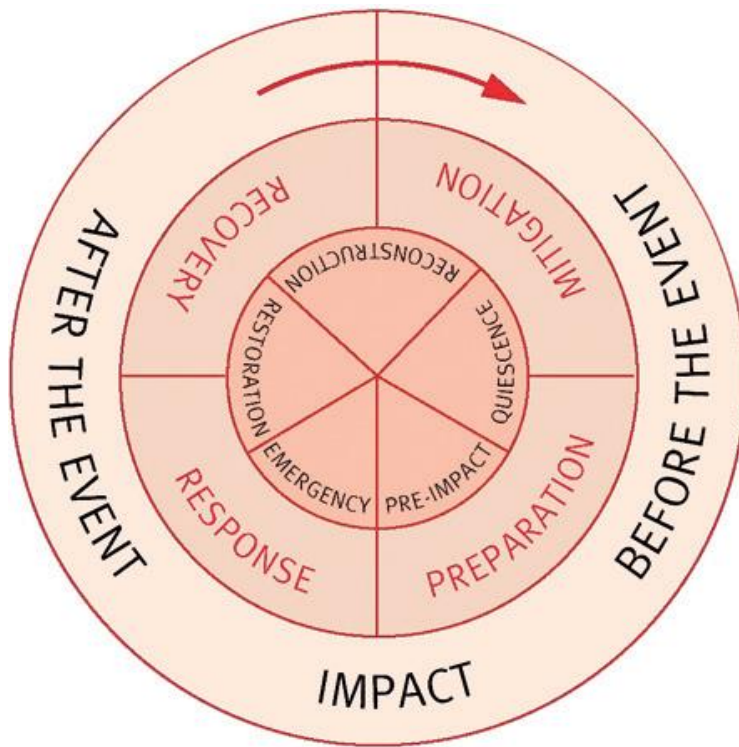


Figure 2.2. The Disaster Management Cycle (Alexander, 2002)

2.1.2. Disaster management and architecture

Response and recovery stages are generally post-disaster activities. Response activities generally include the work of emergency relief organizations, which includes securing the immediate needs of the affected population, such as search and rescue operations, medicine, food, water, and temporary units (such as tents and prefabricated units). These studies can generally be called short-term activities. The rehabilitation or rehabilitation and reconstruction phase includes long-term activities for post-disaster, including reconstruction of socio-cultural and economic structures, damaged structures, and infrastructures (Özden, 2007).

Creating disaster resilient and sustainable communities, post-disaster rehabilitation and reconstruction must be taken seriously. In these stages, the role of the architect and architecture is of great importance. Because the victims should return to normal as quickly as possible and the victims should be placed first in temporary units and then in permanent

units. In this case, the design and construction actions are more vital than the processes of normal times. On the one hand, it is important to design and build new settlements and new environments in a fairly limited time frame, while on the other hand, these units and environment are expected to be strictly tailored to the needs or situation of the victims in order to reduce the socio-economic and psychological consequences of the disaster and trauma (Özden, 2007).

On the other hand, the most common approach to housing people after a disaster consists of three stages: emergency shelter, temporary accommodation, and permanent accommodation. Planning and construction of emergency shelter, temporary shelter, and permanent shelters to be used for a short time after the disaster is also of enormous importance. In each of these stages, architects can apply their design skills and help rebuild dilapidated communities. Therefore, architects stand in an important place between the local population affected by the disaster and planning a sustainable emergency shelter, temporary accommodation, and permanent accommodation (Wagemann & Ramage, 2013).

However, in the fulfillment of all these important responsibilities of architects and architects in the face of disasters, education in disaster management - crisis reduction, recovery after disaster is of great importance (Wagemann & Ramage, 2013).

2.2. Codes of Ethics of Professions

In the most general definition, the concept of "ethics" can be defined as ethics, ethics, morality, morality. The concept of ethics is defined as the science that investigates the essence and foundations of morality, and the branch of philosophy that studies the problems related to human behavior. Ethics is moral philosophy. Ethics investigates the basis of all human behavior and actions. Today, the concept of ethics is seen as a discipline that examines and regulates behavior patterns in business life.

2.2.1. Professional ethics

In its most general definition, the ethical code, which expresses the universal truths in business life, is a set of written rules prepared by the institution to guide the current and future behaviors of the managers and employees of the institution. Professional ethics deals

with the right and wrong behaviors that prevail in a particular profession. Examines the principles and values that guide individuals in their choices (Mc Hugh, 1992).

In the process of formation, development and change of professions, principles based on practice are created that enable the profession to run in order. The expected results from the principles of professional behavior can be listed as follows,

- Behaving honestly and fairly by the members towards the society, the people they serve, the society, the profession and their colleagues,
- To facilitate the decision of what is moral and what is right,
- To prevent the wrong behavior of the members,
- To ensure that the members stay away from the widespread corruption in the society,
- Supporting the members who continue their professional life by adhering to the principles,
- The positive results of these practices will gradually contribute to the dominance of morality in the society.

Code of ethics

Professional ethics is examined from different perspectives. The first and most important of these perspectives is ethical codes. The main purpose of these codes is to improve by self-criticism (Airaksinen, 1998).

The ethical code is the official norms and behavior measures expected by the profession or organization, which guides the employees regarding which behaviors are considered acceptable (Ferrel & Fraedrich, 1994).

Ethical codes can be handled in three ways:

- Code of ethics consists of a short set of principles and is intended to inspire professionals.
- Codes of Professional conduct include detailed regulations and special procedures such as how to behave or what constitutes ethical violations. They have both regulatory and educational functions.
- Codes of practice, on the other hand, are longer, more detailed and special documents than codes of ethical behavior (Aydın, 2016).

Professional ethics codes

The concept of professional ethics codes is also used in the same sense as the principles of professional ethics (Ferrel & Fraedrich, 1994).

Professional ethics principles (codes) are guides that contain advice and directions that guide the behavior of professional practitioners, determine how to behave in the face of specific or general situations or problems, and define the basic character traits that members of the profession should exhibit (Spencer, 1997).

Codes of professional ethics are generally expected to fulfill three basic functions:

- Ethical codes ensure that the ideals of the profession are shared between the society and the professionals.
- Ethical codes provide a general guide to ethical behavior in the profession.
- Ethical codes provide for the development of acceptable standards of conduct required to discipline behavior below expected standards.

Browie and Duska's views on ethical principles and codes;

They stated that the principles of professional ethics are the ethical principles and codes that the members of a profession or organization must comply with. The “Code of Ethics” is the whole of the targets and behaviors that the related persons have to comply with in order to stay in the professional or other groups. The main function of ethical codes is to provide a certain discipline on the group covered and to create the necessary environment for this. For example, statements of principled behavior such as "every member will act with the highest integrity and dignity" are included in ethical codes (Pritchard, 1998).

As a whole, it is very important to adopt ethical principles in spreading ethical behaviors and creating an ethical culture. In order to institutionalize ethical codes, Stead et al. (1990) openly discuss ethical codes at all levels of the organization; They stated that new employees should be given as a part of their orientation training or should be taken as a criterion in the selection of employees. (DeSensi & Rosenberg, 1996)

Why should an organization have ethical codes? The answer to the question can be stated as follows:

- To describe behaviors that are accepted or found acceptable in the organization.
- Raising standards in applications.
- To create examples that will enable the employees of the organization to compare their own behavior.
- Drawing a framework for professional behavior and responsibilities.
- To create a tool for professional identity development.
- To reveal the signs that show what kind of behavior is possible with professional maturity.

Professional ethics codes must be accepted by employees before they are compelled to act. Therefore, before assuming responsibilities regarding the content of the principles, it is necessary for the employees to be informed about these principles in an open atmosphere as possible and to develop them in a participatory manner.

Ethic of disaster

In general, disaster ethics can be examined under two main headings as "before and after the disaster". When the studies on disaster ethics are examined, it is seen that they are mostly about ethical dilemmas encountered in post-disaster studies, and they are related to post-disaster rescue, recovery and mitigation stages.

Generally, in studies on ethical dilemmas during and after disaster recovery, ethical principles during disasters (Prieur, 2011), unorganized aid efforts to the disaster area or the absence of a specific and applicable disaster plan (Güler, Çobanoğlu, 1994) improve the well-being of people, the necessity to have an intervention plan that includes the need for an intervention plan (Zack, 2009), the ethical conflicts experienced by the aid volunteers who come to help the disaster victims (Eryılmaz, Dizer, 2007), ensuring that the activities carried out during the recovery phase meet the needs of the disaster-affected communities at least at the pre-disaster or more advanced level if possible (Özbek, 2011), the studies of post-disaster aid organizations (Jenson, 1997), (Stone, 2007) were examined. In other studies, on the subject, post-disaster recovery and ethical relations were examined mostly in the fields of medicine, medical and psychology (Schuklenk, 2020), (Leider et al. 2017).

However, in the literature, there are very few studies that discuss ethically what should be done before a disaster, and there are no studies on pre-disaster ethics of a professional group, such as architecture, which are highly related to the concept of structure and people, or other related professional groups.

The originality of this study is that it is one of the rare studies on pre-disaster ethics, as well as a study on professional ethics and disaster. Because, in this way, the place of a professional group that plays a key role in the relationship between building and humans, such as architecture, in disaster ethics has been examined. In this way, it provides a forward-looking basis for examining the place of other disaster-related occupational groups in disaster ethics and pre-disaster ethics.

3. ARCHITECTURAL CONSCIOUSNESS IN NATURAL DISASTER: CASE STUDY ETHICAL CODES OF ARCHITECTURE IN DISASTER COMPARISON OF ARCHITECTURAL CONSCIOUSNESS OF JAPAN AND TURKEY IN EARTHQUAKE RESISTANT BUILDING DESIGN

The disasters experienced in the world have shown that the concept of pre-disaster recovery is as important as the concepts of post-disaster recovery or intervention at the time of disaster.

A modern disaster management approach adopts a holistic approach in which all professions are integrated. A profession such as architecture, which has existed since the beginning of history and is directly related to "human and built environment", has a very important relationship with the concepts of disaster and disaster management.

On the other hand, as mentioned above, important deficiencies regarding pre-disaster ethics have been identified in the literature. In addition to this, another deficiency in the literature is to determine the place of disaster ethics within the professional ethics codes of a professional group such as architecture, which is related to the building and people and therefore the concept of disaster. However, the issue of pre-disaster mitigation and preparedness gains great importance after each disaster in terms of reducing the effects of the disaster.

3.1. Methodology

In the first part of the study, the document review method, which is a qualitative data analysis method, was used. Document analysis is a qualitative research method used to analyze the content of written documents meticulously and systematically (Wach, 2013). Document analysis is a systematic method used to examine and evaluate all documents, both printed and electronic materials.

In document analysis, also known as documentary scanning, data is obtained by examining existing records and documents. Document analysis includes the processes of finding,

reading, taking notes and evaluating resources for a specific purpose (Karasar, 2005). In other words, document analysis is a series of processes that take place in the process of examining and evaluating printed and electronic (computer-based and internet-enabled) materials (Bowen, 2009). This process is also defined as the examination of written materials containing information about the phenomenon or phenomena that are aimed to be investigated (Yıldırım & Şimşek, 2013). It is also the collection, systematic examination and evaluation of official or private records (Ekiz, 2015).

In the study conducted to examine the effect of architectural ethical codes on disaster management, the official architecture chambers or organizations of 54 countries in total, 9 from the African continent, 12 from the Asian continent, 4 from the Australian continent, 26 from the European continent, 2 from the North American continent and 3 from the South American continent, professional ethics codes were examined. The words “disaster”, “welfare”, “health”, “safety” and “security” were chosen to be scanned in the sources. It has been tried to determine which countries' ethical codes include these words. Since the architectural ethical codes published by some countries are closed to internet access, only accessible ethical codes were included in the study.

In the second part of the study, the causal comparative analysis method was used to understand the difference between the two countries' approaches to architecture and earthquake. Causal comparison studies are studies to determine the causes of an existing/naturally occurring situation or event and the variables that affect these causes or the results of an effect (Büyüköztürk et al., 2008).

In causal comparison studies, there are at least two groups that are affected differently by the same situation, or two groups that are affected and unaffected by the assumed situation, and these groups are examined in terms of some variables in order to determine the possible causes and influences of the current situation (Cohen & Manion, 1994). Causal comparison research is similar to experimental research in that it tries to explain the cause-effect relationship. However, in these studies, unlike experimental studies, the investigated situation arises independently of the manipulation of the researcher. The researcher, on the other hand, tries to determine the possible causes and effects of this situation (Cohen & Manion, 1994; Büyüköztürk et al., 2008).

The reason why Japan was chosen for this part of the study is that it has the only architectural professional ethics code that includes the word "disaster" among the examined ethical codes. As it has been examined, the word "disaster" is not mentioned in the architectural professional ethics code of Turkey. In addition, the reason why the architectural professional ethics code of the USA, where four of the five words examined in the professional ethical codes were not selected, was not selected, does not show similarity with Turkey in terms of the disasters experienced. The disasters faced by the USA and causing devastating effects are mostly hurricanes. However, Turkey and Japan experience great similarities in terms of encountering disasters and differ greatly in approach to them. Basically, Turkey and Japan share a common catastrophe fate. Both countries are constantly faced with devastating earthquakes (Dallı and Soyluk, 2022b).

When the previous study in the literature is examined, it is seen that the relationship between ethics and errors in earthquakes is examined. The study is on the examination of how the faults seen in the earthquake are evaluated in different ethical codes and has been studied in Japan. However, in this study, only two countries are compared. The data obtained in this part of the study were obtained through the most destructive earthquakes Japan and Turkey faced, and the changes in regulations and disaster management systems afterward. It is limited only by destructive earthquakes, loss of life and property in these earthquakes, building regulations that changed afterwards, and the developments of disaster management systems.

3.2. Limitations

Determining the scope and limitations of the research is extremely important for the conduct of the research. What a research or researcher seeks to measure or examine constitutes the scope of the research. The limitations of the research are that the limits of the inferences that can be made from the research are specified in advance according to the method used in data collection and analysis and the nature of the findings to be obtained (Jupp, 2006).

In this part of the study, which was conducted to examine the effect of ethical codes on disaster management, only the ethical codes published by the chambers of architecture were examined. And in the study, in which the documentation method was used, it was examined whether the words for the concept of disaster in the ethical codes are included in these codes.



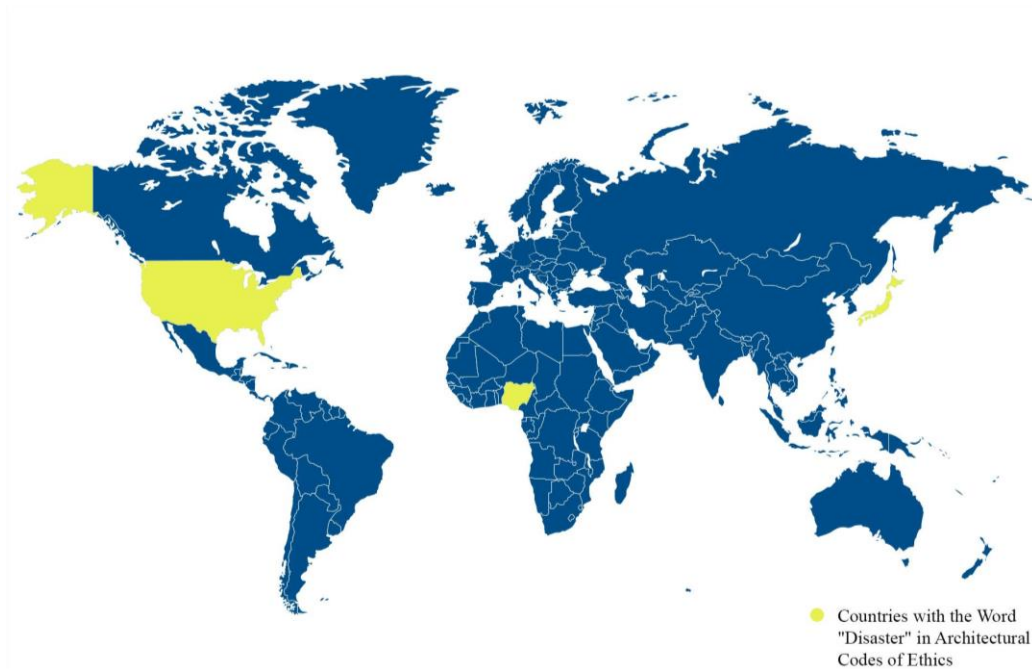
These concepts were chosen as "disaster", "welfare", "health", "security" and "safety". As shown in the Flow Chart, the words determined were chosen from the specific (disaster) to the more general (safety) and increasing in scope. It has been examined not only whether these words exist, but also whether they are used in accordance with the concept of "disaster".

3.3. Results

As a field study, whether the words "disaster", "health", "security", "welfare", "safety" and "security" are used in the ethical codes published by the architectural organizations or chambers of 54 countries were examined using the documentation analysis method. In this result part, the findings of this study are given.

3.3.1. The word “disaster”

Of the 51 architectural ethical codes examined, the word "disaster" is only used in the ethical codes of 3 countries. The word "Disaster" is used in architectural ethical codes published by Japan, U.S.A. and Nigeria (Map 3.1).



Map 3.1. Distribution of the word "disaster" on the world map.

In only Japan of these three countries, the word "disaster" was used to meet the concept of disaster-resilient building design. The word "disaster" in the ethical codes of Nigeria and Croatia is not used in the sense that architects observe the concept of disaster-resistant building design or take this into account in their designs.

As can be seen in the article of 3.3.2 of the ethical code published by Nigerian Institute of Architects (NIA, 2009);

Although the aforementioned ethical code includes the word "disaster", it is a code related to the professional services provided after the disaster. Concepts such as the relationship between disaster and architect, and disaster-resistant building design are not included in the code.

In the ethical code published by The American Institute of Architects, the word "disaster" is used as in the article of Ethical Standards 2.2 with the title of "Public Interest Services" (AIA, 2020):

Again, the word "disaster" is used in the article. However, it is an article that covers post-disaster services and is related to these services. Again, concepts such as the relationship

between disaster and architect, and disaster-resistant building design are not included in the code.

However, when the ethical code of Japan which was published by Architectural Institute of Japan (AIJ) is examined, it is seen that the word "disaster" exactly corresponds to the above-mentioned disaster-resistant building design concept.

When the ethical code mentioned is examined, it is emphasized that the members (architects) should construct safe buildings by considering the disaster risk, under the title of "Construction of secure buildings and a good quality urban environment" in the 2nd part.

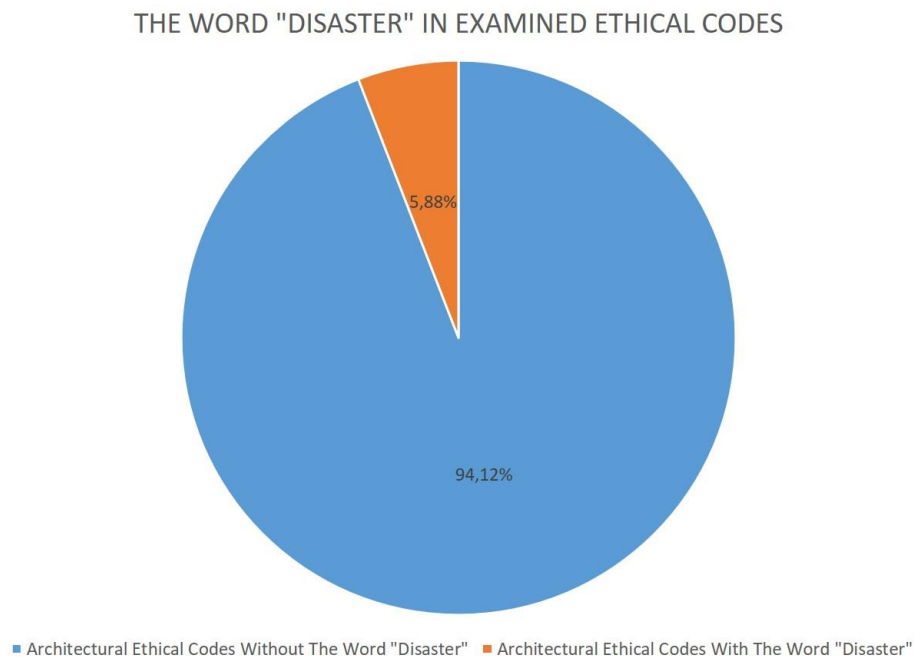
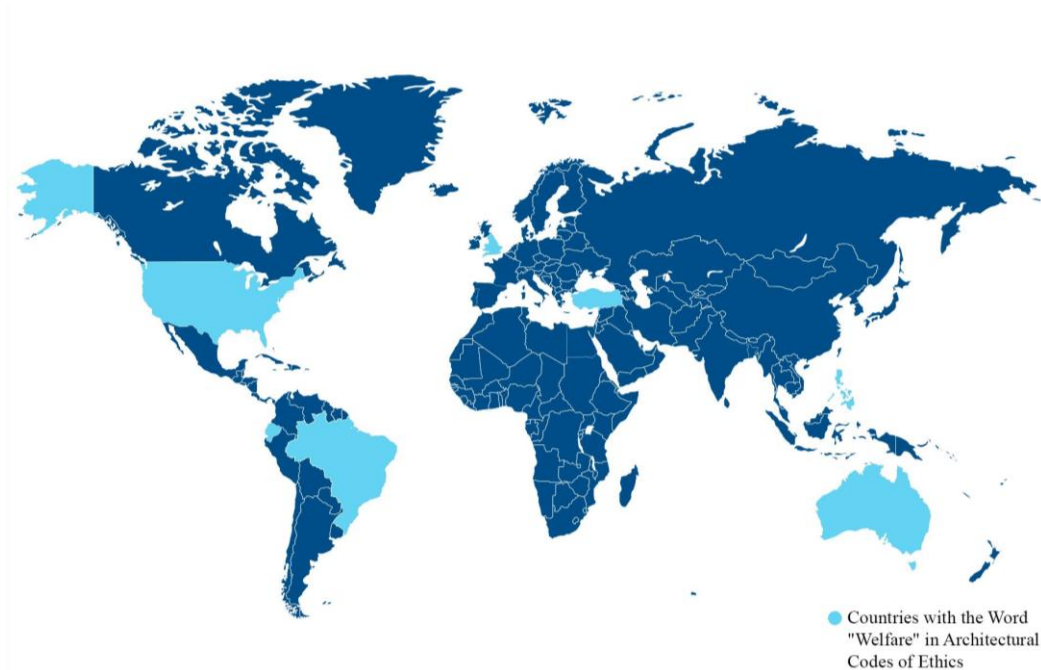


Figure 3.1. Percentage distribution of the word "disaster"

As can be seen in the graph in Figure 3.1, the word "disaster" is mentioned in only 3, proportionally 5,88% of the ethical codes of the architectural organizations of 51 countries. Of these three countries, only in Japan, the word "disaster" is used in a way that includes the meanings of disaster-resilient design and preparedness for disasters.

3.3.2. The word “welfare”

Of the 51 architectural ethical codes examined, the word "welfare" is only used in the ethical codes of 7 countries. The word "Welfare" is used in architectural ethical codes published by Ecuador, Philippines, Australia, Turkey, U.S.A. and Brasil (Map 3.2).



Map 3.2. Distribution of the word "welfare" on the world map

In the code of ethics published by Ecuador's official architectural organization, Colegio nacional De Arquitectos Del Ecuador, the word "welfare" appears in article "a" of the title "Art. 11- The Architect and The Society". (CAE, 2013).

In the given code of ethics, it is mentioned that architects should present their services to the welfare of the society and that the welfare of the society should be determined as the top priority.

In the ethical code published by the Philippines Professional Regulation Commission (PRC), another country where the word "welfare" is mentioned in the articles in the ethical codes, it is mentioned in the titles of “Section 3. Relations with the Public” and Section 4. “Relations with the Client” (PRC, 2006):

As it can be understood from the name of the chapter, in the article that regulates the relationship between the architect and the society, it is mentioned that the architect, above all, has a responsibility to the society as a good citizen and that he is a part of the welfare of the society and that he should continue his profession accordingly.

In the article regulating the relationship between the client and the architect above, it is mentioned that the architect should protect the client's rights as long as they do not conflict with the welfare of the society.

The word "welfare" is used in the introductory part of the code of ethics published by The Royal Australian Institute of Architects, the official architectural organization of Australia (RAIA, 2017):

In the introduction, which defines the content of the code of ethics, the word "welfare" refers to the fact that architecture is a unique profession, and in the practice of the profession, the architect aims to improve the quality of the built environment and raise the welfare of society. However, it is not given as a separate article.

The word "welfare" is included in the article 2.13 of the code of ethics published by the Türkiye Mühendis ve Mimarlar Odaları Birliği (TMMOB, 2008):

In the given article, it is mentioned that the professionals practicing the profession of architecture should be aware of the concepts of welfare or social welfare, social benefit, should pay attention to this, should not be involved in any event contrary to this, and should also inform the organization about the subject.

In the ethical code published by The American Institute of Architects in the USA, the word "welfare" is used in the Ethical Standards 1.5 article and with the title of "Design for Human Dignity and the Health, Safety, and Welfare of the Public" (AIA, 2020):

In the given article, it is mentioned that the architect should use all his/her professional experience and knowledge in a way that increases and ensures the welfare, health and safety of the society and people while performing his profession.

In the ethical code published by Conselho de Arquitetura e Urbanismo do Brasil, the official architectural organization of Brazil, the word “welfare” in article 2.2. Rules 2.2.7. (CAU/BR, 2013):

In the given article, it is mentioned that architects (and city planners) should have an understanding that ensures and increases human and public health, welfare and safety in their designs, that is, in their professional practices, similar to the articles in the ethical codes mentioned above.

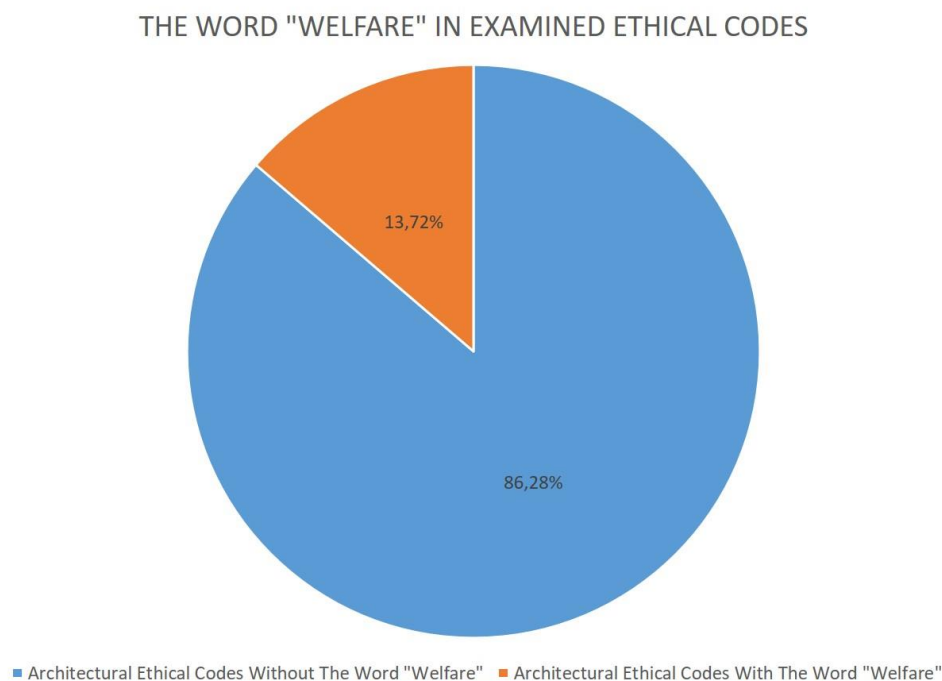
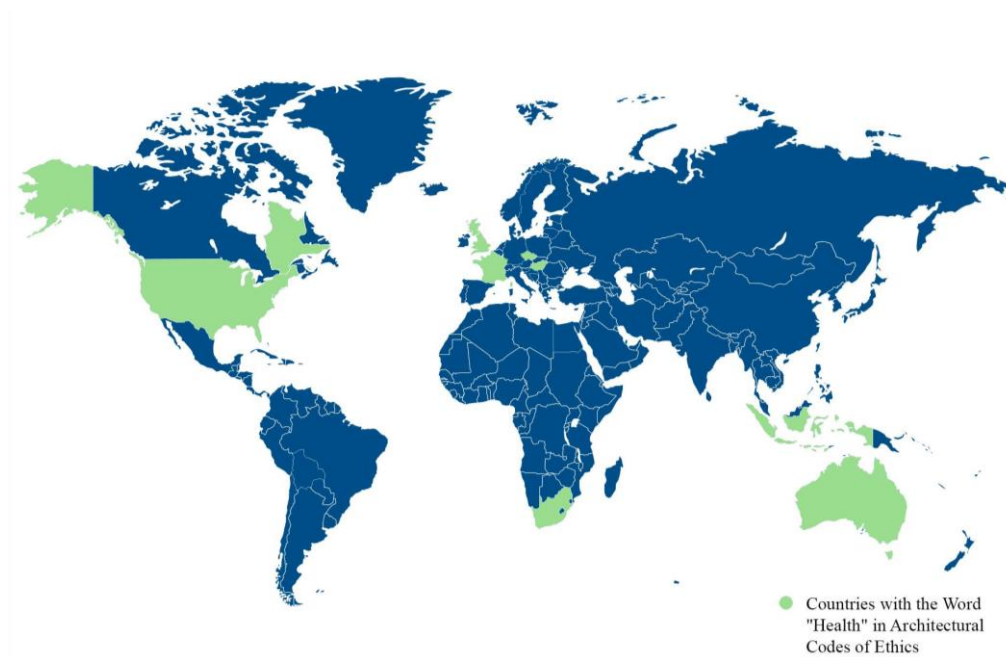


Figure 3.2. Percentage distribution of the word "welfare"

As can be seen in the graph in Figure 3.2, the word "welfare" is mentioned in only 7, proportionally 13,72% of the ethical codes of the architectural organizations of 51 countries. It is mentioned as a separate article in all of them except Australia, and it mentions that the architect must design for the welfare of the society by considering the welfare of the society, and that he has a responsibility in this sense. It is not given as a separate item in the ethical code spread only by The Royal Australian Institute of Architects, but it is mentioned that the architect has such a responsibility in general.

3.3.3. The word “health”

Of the 51 architectural ethical codes examined, the word "welfare" is only used in the ethical codes of 9 countries. The word "Health" is used in architectural ethical codes published by South Africa, Indonesia, Australia, Czech, England, Hungary, Prince Edward Islands, Quebec, U.S.A. (Map 3.3).



Map 3.3. Distribution of the word "health" on the world map

In the ethical code published by the South African Council for The Architectural Profession, the official architectural organization of South Africa, the word "health" is used in the article of 6.5 under the title of “Public Interest and Environmental Protection” (SACAP, 2021):

In the given article, it is mentioned that professionals in the architectural profession should inform them in writing of the possible consequences when they do not follow the recommendations of their employers or clients. It does not explain the responsibilities of architects in public health.

The word "health" is used as follows in the introductory part under the title of “General Provisions” of the code of ethics published by Indonesian Institute of Architects, the official architectural organization of Indonesia (IAI, 2017):

In the paragraph in the general provisions section, the definition of architect and architecture is made and the word "health" is defined as a factor that must be present in a good architecture. As a result, although the word "health" is not mentioned in any article in the rest of the code, it is mentioned in the general provisions section and the subject of health is mentioned.

The word "health" is used as follows in the introductory part of the code of ethics published by The Royal Australian Institute of Architects, the official architectural organization of Australia (RAIA, 2017):

In the introduction, which defines the content of the code of ethics, the word "health" refers to the fact that architecture is a unique profession, and in the practice of the profession, the architect aims to improve the quality of the built environment and raise the health of society. However, it is not given as a separate article.

In the ethical code published by The Czech Chamber of Architects, the official architectural organization of Czech Republic, the word "health" is used in the article 1 under the title of "Section 1" (CCE, 2020):

Similar to the above article, what and who architects and architects are, and their responsibilities for public health are defined. However, unlike the article above, it is not included in the introduction, but as a separate article in section 1.

In the ethical code published by Royal Institute of British Architects in the UK, the word "welfare" is used in article of 1.15 under title of "Skill, knowledge, care, ability" and in the article 6.1, 6.3, 6.4, 6.5, 6.6, 6.7 under the title of "Health and safety" (RIBA, 2019):

The word "health" is mentioned in the article with the same title, which is about skills and knowledge, care and talent of architects, as architects should follow updates on health, sustainability and environmental protection in order to keep their knowledge up to date.

A special heading has been opened for health and safety in the ethical code published only in the UK. In the following articles, the word health is used in the articles of 6.1, 6.3, 6.4, 6.5, 6.6, 6.7 (RIBA, 2017):

In the 6.1 article, it is mentioned that architects should know and follow the relevant current laws and regulations regarding public health while continuing their profession.

In both articles of 6.3, 6.4, it is mentioned that architects should take steps towards the health of their customers, the institution they serve and the society they serve, and that they should consider this as a priority while continuing their profession.

In the 6.5 article, it is mentioned that architects should not take any action or project against public health while continuing their profession.

In the article of 6.6, it is stated that if architects receive a request contrary to public health while continuing their profession, they should warn their customers that this is wrong.

In the article of 6.7, it is mentioned that if architects, while continuing their profession, knowingly detect a situation against public health from the employer or their customers, they should warn the employer or their customers about this situation, refuse to be a partner in this situation, and inform the authorities if it continues.

In the ethical code published by the Hungarian Chamber of Architects in Hungary, the word “health” is used in the article of 1 under the title of “Basic Principles”. In the given article, it is mentioned that architects are obliged to comply with the laws while continuing their profession and to consider the public health in their designs (MEK, 2020).

In the ethical code published by Architects' Association of Prince Edward Island the official architectural organization of Prince Edward Island, the word "health" is used in the article of 1st (AAPEI, 1978):

In the given article, it is stated that those who continue the architectural profession are responsible for the health of their employers, employees, customers and the society in general, during the period of their profession, and they should be aware of this.

In the ethical code published by Ordre des architectes du Québec the official architectural organization of Quebec, the word "health" is used in the article of 7th (OAQ, 2021):

In the article in question, it is mentioned, with a general reference, that architects are responsible to the people and society they serve while continuing their architectural profession, and that they have an impact on public health in all their works.

In the ethical code published by The American Institute of Architects in the USA, the word “health” is used in the Ethical Standards 1.5 article and with the title of “Design for Human Dignity and the Health, Safety, and Welfare of the Public”, Ethical Standards 2.4 with the title of “Environmental Equity and Justice”, Ethical Standards 6.3 with the title of “Building Materials”, Ethical Standards 6.4 with the title of “Ecosystems” and Ethical Standards 6.5 with the title of Climate Change (AIA, 2020):

In the article of Ethical Standards 1.5, it is stated that architects should design by considering the health of the society and transfer their professional knowledge and skills in this direction during their career.

In the article of Ethical Standards 2.4, it is stated that while architects continue their profession, they have responsibilities towards the environment to their customers, employees and employers, that they should make recommendations in line with ethical values on issues such as public health, and that this issue is also within their responsibilities.

In the article of Ethical Standards 6.3, it is stated that architects should prioritize public health in the materials they will use in their designs while continuing their profession and should not use materials that are contrary to environmental and public health.

In articles of Ethical Standards 6.4 and 6.5, it is stated that architects should be in cooperation with their customers on the issues of protecting the environment and public health while continuing their profession.

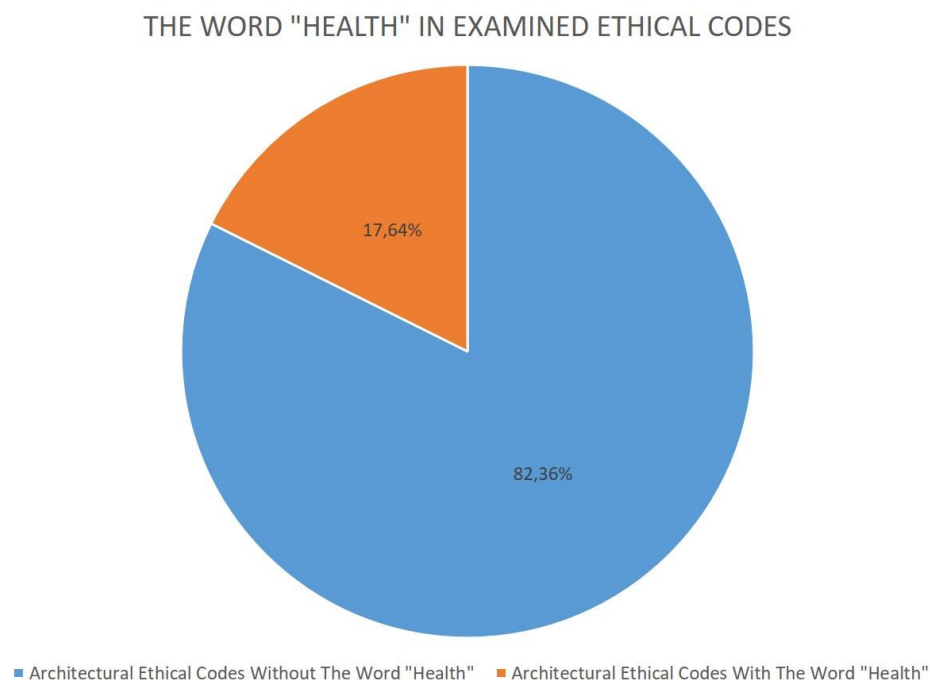


Figure 3.3. Percentage distribution of the word "health"

As can be seen in the graph in Figure 3.3, the word "health" is mentioned in only 9, proportionally 17,64% of the ethical codes of the architectural organizations of 54 countries. Ethical codes published by architectural organizations in countries such as South Africa, Indonesia, Australia, Czech, Hungary, Prince Edwards Island, Quebec are given as a general provision in a single article. In addition to being mentioned as a general provision in the ethical codes published by the architectural organizations of the USA and England, different subjects are mentioned in the articles under a special title (as examined above).

3.3.4. The word “safety”

Of the 51 architectural ethical codes examined, the word "Safety" is only used in the ethical codes of 19 countries. The word "Safety" is used in architectural ethical codes published by Nigeria, South Africa, Georgia, Indonesia, Australia, New Zealand, Croatia, Hungary, England, Italy, Luxembourg, Scotland, Slovenia, Spain, Brunswick, Prince Edward Island, Canada, U.S.A., Brasil (Map 3.4).

The word "safety" is used in the introductory part under the title of "General Provisions" of the the code of ethics published by Indonesian Institute of Architects, the official architectural organization of Indonesia (IAI, 2017):

In the section of general provisions, the definition of architect and architecture is made and the word "safety" is defined as an element that must be present in a good architecture. As a result, although the word "safety" is not mentioned in any article in the continuation of the law, it is included in the general provisions section and the health issue is mentioned.

The word "safety" is in the introductory part with the same title in the code of ethics published by The Royal Australian Institute of Architects, the official architectural organization of Australia (RAIA, 2017):

In the introduction, which defines the content of the code of ethics, the word "safety" refers to the fact that architecture is a unique profession, and in the practice of the profession, the architect aims to improve the quality of the built environment and raise the health, safety and welfare of society. However, it is not given as a separate article.

The word "safety" is used in the article of 50 with the title of "Obligations to report on risk" in the code of ethics published by the New Zealand Registered Architects Board (NZRAB), the official architectural organization of New Zealand (NZRAB, 2018):

In the article, it is stated that an architect has the responsibility of notifying and reporting any architectural issue that endangers a person during his/her career, to the relevant persons and institutions.

The word "safety" is used under the title of "Quality of Execution" in the code of ethics published by the Croatian Chamber of Architects (CCA), the official architectural organization of Croatia (CCA, 2013):

In the article, it is mentioned that the buildings and the materials used in the buildings should be designed and produced with an understanding that is sustainable, high quality, suitable for modern conditions and prioritizing the safety of the user.

In the ethical code published by Royal Institute of British Architects in the UK, the word “safety” is used in the article of 1.15 with the title of “Skill, knowledge, care, ability”, in the articles of 6.1, 6.3, 6.4, 6.5, 6.6, 6.7 under the title of Health and safety (RIBA, 2019):

The word "safety" is mentioned in the article with the same title, which is about skills, knowledge, care and talent of architects, as architects should follow updates on health, safety, sustainability and environmental protection in order to keep their knowledge up to date.

A special heading has been opened for health and safety in the ethical code published only in the UK. In the following articles, the word safety is used in the articles of 6.1, 6.3, 6.4, 6.5, 6.6, 6.7 under the title of Health and safety (RIBA, 2017):

In the article of 6.1, it is mentioned that architects should know and follow the relevant current laws and regulations regarding safety of the public while continuing their profession.

In both articles of 6.3 and 6.4, it is mentioned that architects should take steps towards the safety of their customers, the institution they serve and the society they serve, and that they should consider this as a priority while continuing their profession.

In the article of 6.5, it is mentioned that architects should not take any action or project against public health while continuing their profession.

In the article of 6.6, it is stated that if architects receive a request contrary to the safety of the public while continuing their profession, they should warn their customers that this is wrong.

In the article of 6.7, it is mentioned that if architects, while continuing their profession, knowingly detect a situation against the safety of the public from the employer or their customers, they should warn the employer or their customers about this situation, refuse to be a partner in this situation, and inform the authorities if it continues.

In the ethical code published by the Hungarian Chamber of Architects in Hungary, the word “safety” is used in the article of 1 under the title of “Basic Principles” (MEK, 2020):

In the article, it is mentioned that architects are obliged to comply with the laws while continuing their profession and to consider the safety of the public in their designs.

In the ethical code published by Italy's National Council of Architects, Planners, Landscape Architects and Conservationists (Consiglio Nazionale degli Architetti, Pianificatori, Paesaggisti e Conservatori) (CNAPPC), the word "safety" is used under the title of "Preamble" (CNAPPC, 2021):

In the paragraph is defined as a preface, and it is mentioned that the architect should use his knowledge and skills to meet the needs of the client, protect the cultural heritage, and prioritize the safety of the society while performing his profession. Although it is mentioned as a general definition in the preface, the word "security" is not mentioned in a separate article.

In the ethical code published by Order of Architects and Consulting Engineers (Ordre des Architectes et des Ingénieurs-Conseils) (OAI) the word "safety" is used under the titles of "Art 20", "Art 21" and "Art 23" (OAI, 2018):

In the article under the title of "Art 20"; It is stated that an architect coming from a different country is subject to the disciplinary provisions given to architects who are citizens of Luxembourg in order to protect the safety of the clients. In this article, the word "safety" is used in the sense of securing the rights of customers.

In the two articles under the titles of "Art 21" and "Art 23", it is not stated that architects are obliged to do or what they should avoid for public health and safety, and in this sense, the principles of legal regulations are mentioned. Although the word safety is used to mean the security of the society, it was not used as a guide, demarcation or advice to architects in this sense.

In the ethical code published by Architecture and Design Scotland (A&DS) in Scotland the word "safety" is used in the article of 3.3 under the title of "Relationship with Board Members and Employees of the Public Body (including those employed by contractors providing services)" (A&DS, 2013):

In the article is not about the responsibilities of architects towards society, but is about the architects' working environment should be a safe and healthy environment. It has been stated that architects, like everyone else, should work in a fair, safe and healthy environment, and that everyone working in the workplace should be respectful to each other. Apart from the other articles, the article that specifies the rights and responsibilities of architects towards the society and the environment, and their rights, differs from the others in this sense.

In the ethical code published by The Chamber of Architecture and Spatial Planning of Slovenia (Zbornica Za Architecturo in Prostor Slovenije) (ZAPS) in Slovenia the word "safety" is used in the article of 1 under the title of Article 3 "(Protection of public interest)" (ZAPS, 2018):

In the article, it is stated that all city planners, architects and landscape architects who are members of the organization are obliged to ensure the health and comfort of the society and the safety of the buildings they design while continuing their professional lives.

In the ethical code published by Superior Council of the Associations of Architects of Spain Architects in Spain the word "safety" is used under the title of "Preamble" (CSCAE, 2021):

In the paragraph given only as a preface, a general definition of architecture is made and it is emphasized that architecture and architects are a profession for people to live and shelter in safe and healthy conditions, and it is mentioned that architects should protect the concept of natural and built environment or cultural heritage in this sense. However, the word "security" is not mentioned in any other article except for the part given only as a preface.

In the ethical code published by Architects' Association of New Brunswick (AANB) in Brunswick the word "safety" is used in the article of 14.5.1 under the title of "In practicing Architecture, an Architect shall not knowingly violate any law or regulation" (AANB, 2020):

In the paragraph given in the article about architects knowingly violating the law, the word "security" is not used in a way that refers to the safety of the community or the safety of buildings. It is stated that architects do not violate the rules throughout their profession, but construction safety is out of the question since it is not an issue in architectural practice.

In the ethical code published by Architects Association of Prince Edward Island (AAPEI) in Brunswick the word “safety” is used under the title of “Appendix” (AAPEI, 2020):

In the article given as an appendix, it is mentioned that the architect should show the necessary respect for the health and safety of the employer, employee, customer and society and should always be aware of this.

In the ethical code published by Royal Architectural Institute of Canada (RAIC) in Canada the word “safety” is used under the title of “Implementation” (RAIC, 2020):

In the article given as the explanation of the title of respect in the application section, it is mentioned that architects should respect people, the natural environment, the health and safety of the society, and that they have a responsibility in making the environment based on cooperation and respect.

In the ethical code published by The American Institute of Architects in the USA, the word “safety” is used in the article of Ethical Standards 1.5 under the title of “Design for Human Dignity and the Health, Safety, and Welfare of the Public”, in the article of “Rule 2.105”, under the title of “Commentary” and in the article of Ethical Standards 2.4 under the title of “Environmental Equity and Justice” (AIA, 2020):

In the article of Ethical Standards 1.5, it is stated that architects should design by considering the safety of the society and transfer their professional knowledge and skills in this direction during their career.

In the of Rules 2.105, it is mentioned that if architects, while continuing their profession, knowingly detect a situation against the safety of the public from the employer or their customers, they should advise the employer or their customers and warn them about this situation, refuse to be a partner in this situation, and inform the authorities if it continues.

In the article given as commentary, it is mentioned that if architects, while continuing their profession, knowingly detect a situation against the safety of the public from the employer or their customers, they should advise the employer or their customers and warn them about this situation, refuse to be a partner in this situation, and inform the authorities if it continues.

In the of Ethical Standards 2.4, it is stated that while architects continue their profession, they have responsibilities towards the environment to their customers, employees and employers, that they should make recommendations in line with ethical values on issues such as public health, and that this issue is also within their responsibilities.

In the ethical code published by Conselho de Arquitetura e Urbanismo do Brasil, the official architectural organization of Brazil, the word “safety” is used in the article of 2.2.7 under the title of “2.2. Rules” (CAU/BR, 2013):

In the article in question, it is stated that architects (and city planners) should have an understanding that ensures and increases the health, welfare and safety of people and society in their designs, and that they should be prioritized above all else.

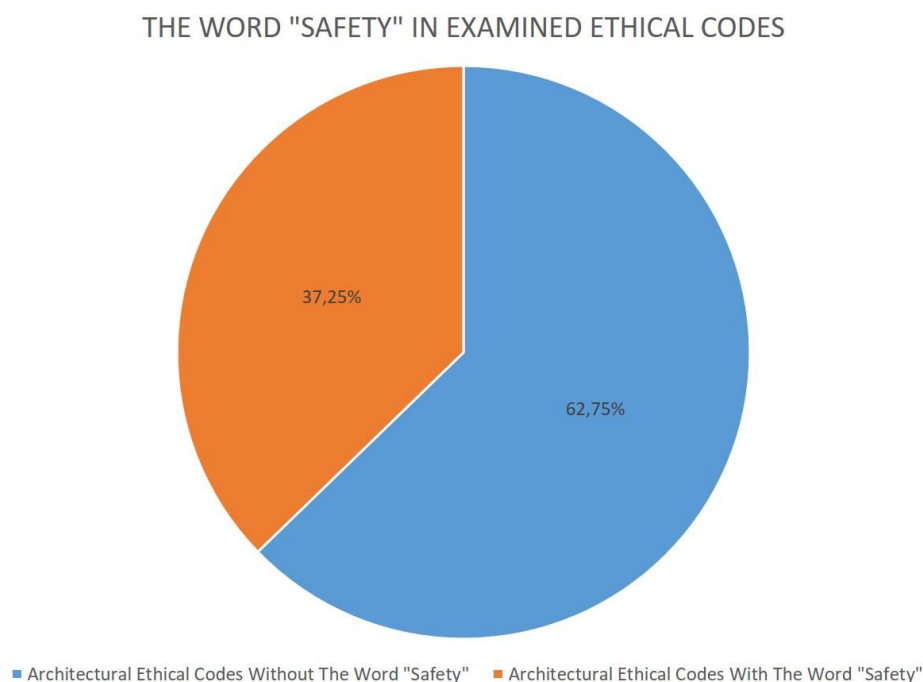


Figure 3.4. Percentage distribution of the word "safety"

As can be seen in the graph in Figure 3.4, the word "safety" is mentioned in 19, proportionally 37,25% of the ethical codes of the architectural organizations of 51 countries. Ethical codes published by architectural organizations in countries such as South Africa, Indonesia, Australia, Hungary, Italy, Spain, Prince Edward Island, Brunswick and Canada are given as a general provision in a single article. Nigeria, New Zealand, Italy, Luxembourg, Scotland, Slovenia and Brazil are included in the code as a separate article, although not

The word "security" is used articles 6, 7 in the code of ethics published by The Statutes Of The Republic Of Singapore (SSO, 2017):

In the two related articles, the security of the society, the security of the buildings or the work security of the architects are not mentioned. The word security refers to the payment relationships between architects and their clients in both articles.

The word "security" is used in the article of 4.3 under the title of “Competent management of business” in the code of ethics published by The Architectural Practice Board of South Australia in South Australia (APBSA, 2009):

The article does not mention the safety of the society, the safety of buildings or the safety of architects in their working environment. In the relevant article, it is stated that architects should protect the electronic and written resources of their clients throughout their professional lives. In other words, the word security is expressed as document security.

The word "security" is used in the introduction part with the same title in the code of ethics published by the Croatian Chamber of Architects (CCA), the official architectural organization of Croatia (CCA, 2013):

In the paragraph in the introduction, it is mentioned that the architectural ethics mentioned are based on the protection of health, sustainability, climate and security. In addition, the word "security" is not included in an article.

In the ethical code published by Royal Institute of British Architects in the UK, the word “security” is used in the article of 12.1 with the title of “Practical Completion” (RIBA, 2019):

In the article, the obligations determined for architects to obtain the necessary documents to perform their services in the construction site are mentioned. The word security is included here as it is used in the sense of assurance or collateral.

In the ethical code published by The Royal Institute of the Architects of Ireland in Ireland, the word “security” is used in the article of 2.2 (RAIA, 2009):

In the article does not mention the safety of the society, the safety of buildings or the safety of architects in their working environments. In the relevant article, it is stated that architects should respect the confidentiality of the data of their clients or employers, whom they serve throughout their professional lives. The word security is used in this article in the sense of data security.

In the ethical code published by Italy's National Council of Architects, Planners, Landscape Architects and Conservationists (Consiglio Nazionale degli Architetti, Pianificatori, Paesaggisti e Conservatori) (CNAPPC), the word "security" is used in the article of 3st (CNAPPC, 2021):

The article does not mention the safety of the society, the safety of buildings or the safety of architects in their working environments. In the relevant article, it is mentioned that architects must act in accordance with the law in social, security and tax matters throughout their professional lives. The word security is used in the sense of social security.

In the ethical code published by Order of Architects and Consulting Engineers (Ordre des Architectes et des Ingénieurs-Conseils) (OAI) the word "safety" is used in the article of 2 under the title of "Art 21", article of 22 under the title of "Art 22", in the article of 2.c. under the title of "Art 32" (OAI, 2018):

In the articles, issues related to the safety of the society, the safety of the buildings or the safety of the working conditions of the architects are not mentioned. Regulations, practices and sanctions related to social security are discussed. The word "security" is used here as social security.

In the ethical code published by The Chamber of Architecture and Spatial Planning of Slovenia (Zbornica Za Architecturo in Prostor Slovenije) (ZAPS) in Slovenia the word "security" is used in article titled wit "Article 18 (Members and ZAPS" (ZAPS, 2018):

The article does not mention the safety of the society, the safety of buildings or the safety of architects in their working environments. In the relevant article, it is mentioned that the

architects cannot serve professionally, that is, the directives that are barred from the profession. In the relevant article, the word "security" is included as a security measure.

In the ethical code published by Architects Association of Prince Edward Island (AAPEI) in Brunswick the word "security" is used in the article "c" under the title of "9.1.10- Protection of Members of Council and Officers" (AAPEI, 2020):

The article does not mention the safety of the society, the safety of buildings or the safety of architects in their working environments. In the given article, in the article created for the protection of the rights of the organization and the authorities, the conditions related to the guarantee of the security of the investments to be made for the organization are expressed. In the relevant article, the word "security" is used as a security guarantee.

In the ethical code published by Board of Architects, Professional Engineers and Quantity Surveyors (BAPEQS) in Brunei the word "security" is used under the title of "Conduct towards other professions" (BAPEQS, 2018):

The article does not mention the safety of the society, the safety of buildings or the safety of architects in their working environments. The relevant article also includes the regulations regarding the security of the fees that the architects should receive. The word "security" is expressed as collateral.

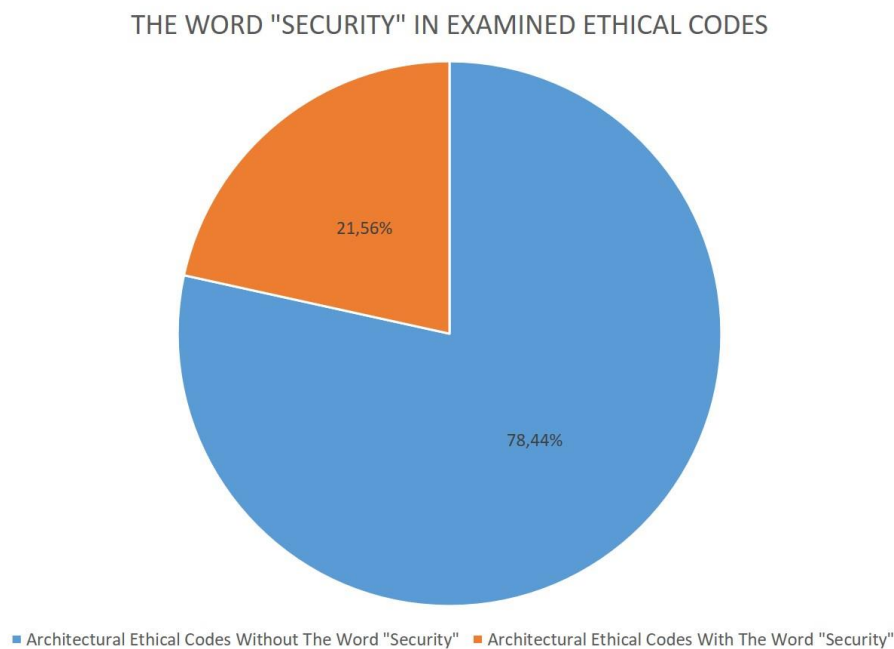


Figure 3.5. Percentage distribution of the word "security"

As can be seen in the graph in Figure 3.5, the word "security" is mentioned in 11, proportionally 21,56% of the ethical codes of the architectural organizations of 51 countries. Ethical codes published by architectural organizations in countries such as Indonesia, Singapore, South Australia, Israel, Croatia, England, Ireland, Italy, Luxembourg, Slovenia, Brunswick and Brunei are examined. Of the 11 ethical codes in which the word "Security" is mentioned, only one article is mentioned in the code of ethics published in Indonesia, to define the responsibilities of the architect in terms of public safety. In other ethical codes, as mentioned above, it is used in terms of social security measures, data security, payment security within the organization.

3.3.6. Discussions

Professional ethical codes are the set of rules that determine the relationship of professional professionals with each other, with their colleagues, with employers or employees, and with society. It is the sum of the values that outline their responsibilities towards the aforementioned individuals and institutions and, more importantly, towards the society.

This guidance is very important in terms of relations between colleagues, regulating relations with individuals or institutions served, drawing certain frameworks, determining and

protecting rights. However, it is much more important in terms of determining the responsibilities towards the society, that is, the public.

Especially in terms of professions such as architecture, which are highly related to people directly and indirectly to the society, it is extremely necessary for the responsibilities to the society and the professionals who will do this profession to know these responsibilities, to keep these responsibilities in the foreground, for the safety, happiness and comfort of the society.

Disasters, on the other hand, are natural events that disrupt the peace of the society and harm the society rather than an individual effect. Because it harms the welfare, health, safety and security of the society. For this reason, architects who design elements that have direct communication with people, such as buildings, have many responsibilities towards society. Because, as can be seen in the studies and reports examined and mentioned here, structures are one of the most important causes of loss of life, injury and economic damage to people in disasters.

For this reason, in this study, ethical codes published by architectural organizations in the world were scanned, 5 words related to disasters were selected and it was examined whether they were included in these codes (Figure 3.6). These words were determined as "disaster", which are indirectly related to disasters, "welfare", "health", "safety", "safety" because disasters threaten the welfare, health, safety and security of the society, and ethical codes are examined by document analysis method (Table 3.1).

Table 3.1. Examined Architectural Professional Ethics Codes and Distribution of 5 Words

Countries	Disaster	Welfare	Health	Safety	Security
Bangladesh					
Ecuador					
Ghana					
Nigeria					
Sierra Leon					
South Africa					
Brunei					
Georgia					

Table 3.1. (Continue) Examined Architectural Professional Ethics Codes and Distribution of 5 Words

Hong Kong					
India					
Indonesia					
Israel					
Japan					
Korea					
Malaysia					
Philippines					
Singapore					
Australia					
S. Australia					
South Wales					
N. Zealand					
Belarus					
Belgium					
Bulgaria					
Croatia					
Czech					
England					
Estonia					
Hungary					
Iceland					
Ireland					
Italy					
Lithuania					
Luxembourg					
Macedonia					
Malta					
Netherlands					
Portugal					
Scotland					
Slovakia					
Slovenia					
Spain					
Turkey					
Brunswick					

Table 3.1. (Continue) Examined Architectural Professional Ethics Codes and Distribution of 5 Words

P. Edward Is					
Quebec					
Canada					
USA					
Bolivia					
Brasil					
Puerto Rico					



Figure 3.6. Percentage distribution of the 5 words overall

According to the findings, the least common word among these words in ethical codes was determined as "disaster". It is proportionally 5.88% among all scanned ethical codes. In fact, it is used in the sense of "precaution against disaster" only in Japan, in addition to being included in 3 ethical codes. In the other two countries, it is included in an article referred to as "services rendered free of charge after disasters". In this sense, it can be said that only in Japan, architects include the concept of "resistance to disaster" in the ethical code and that architects are aware of their responsibilities towards society.

Afterwards, the word "disaster" is followed by the word "welfare" with 13.72%. The word, which is found in 7 of the examined ethical codes, is mentioned in the articles stating that the architect has important responsibilities towards the society in general and that he should be aware of the need to protect the welfare of the society throughout his professional life. It is not given as a separate item in the Australian ethical code but is defined in the introduction. Although different sentences are used with very similar meanings. However, the word that has a less specific meaning compared to the word "disaster" is still the 2nd least mentioned word.

Afterwards, the word "health" is the third least common word, with 17.64%. It appears in the ethical codes published by 9 countries in the examined ethical codes. It has been used in the meanings such as possession, not taking any action against the health of the society. While it is included in the introductory part or article in the ethical codes of 7 countries, it has been examined under separate headings in the ethical codes published by the UK and the USA, and it has been stated in different articles in addition to these. However, a similar situation with the word "welfare" is also seen here. A very general concept such as health or public health was found to be the third least common word in the professional ethical codes examined.

The second most common word with 21.56% was "security". The word "security", which is encountered in the ethical codes published by 11 countries, is used in articles that mean social security, data security, etc. It is used only in the sense of protecting public health and safety in the professional ethics code published by Croatia. Even when it is used in the sense of data and social security, which is quite necessary, it is found in 11 countries, while it is almost never used in terms of structure, environment or public security.

The most common word is "safety" with 37.25%. It is included in the professional ethics code published by 19 countries in total. In 9 countries, general information is given in the introduction, while in 7 countries it is encountered in a separate article. However, it has only been examined under a separate heading in the ethical code published by the UK and the USA. The word "safety", which is used in the same sentence or paragraph as the word "health", appears more promisingly than the word "health".

3.4. Comparison of Architectural Consciousness of Japan and Turkey in Earthquake Resistance

Earthquakes are one of the natural disasters that have caused the greatest damage to people, countries and geographies since the beginning of humanity. The United Nations defines a disaster as the serious destruction of the functioning of a community or society. Earthquakes, on the other hand, include widespread human, financial, environmental and economic effects (Mermer, Donmez, & Daghan, 2018). While these effects can be seen in a lesser way in some earthquakes, they can reach destructive dimensions in some earthquakes. Some countries and geographies, on the other hand, face more earthquakes and destructive consequences than others, with their proximity to active fault lines. Countries located on active fault lines are faced with many earthquakes of varying magnitude in regular periods.

Living with an earthquake also brings many problems and facts. These are concepts that countries should take measures and work on such as earthquake-resistant building design, disaster management, regulations, preparedness, education and technological developments. And societies and countries that frequently encounter disasters such as earthquakes have tried to take measures and take important steps against earthquakes in these areas for a long time.

Since their history, Japan and Turkey are the main countries that come to mind when earthquakes are mentioned. Although the characteristics and magnitudes of the earthquakes they encountered are different from each other, it can be said that they have a common destiny in terms of living and meeting with the concept of earthquake. For example, in and around Japan, one-tenth of earthquakes in the world occur. On average there is one M7 earthquake each year in Japan. It has been suffering frequent earthquake disasters even since ancient times (Matsu'ura, 2017).

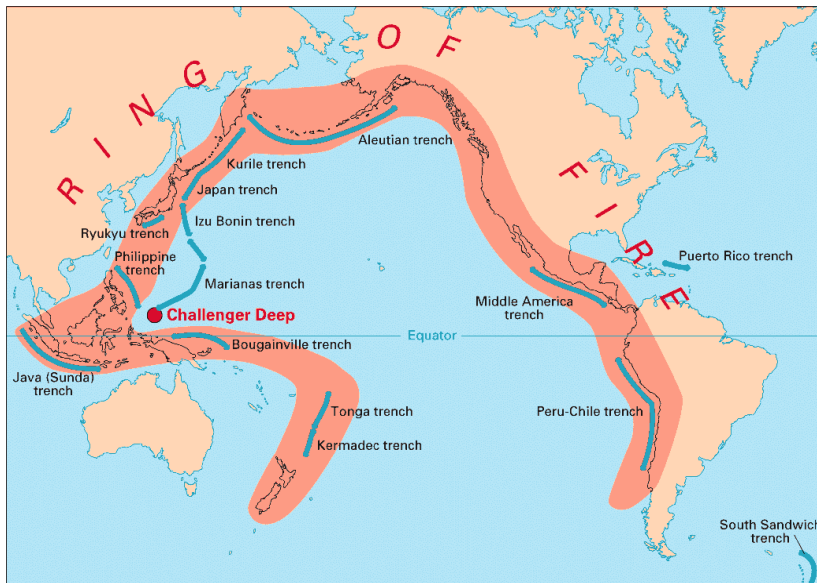
On the other hand, Turkey is in one of the world's most active seismic regions and a large part of the country is at risk of a major disaster (Bommer et al., 2002). In the list provided by the American Geological Research Foundation; Approximately 6% of the number of earthquakes in world history took place in Turkey (Bikçe, 2015).

However, apart from the characteristics and magnitudes of earthquakes, it can be said that these two countries are quite different from each other in terms of earthquakes. They differ

from each other especially when it comes to measures taken, seismic history, regulations developed, disaster management, disaster preparedness, education, technologies developed and used, and lessons learned from earthquakes. In this context, considering the devastating earthquakes experienced by Turkey in recent years, it is important to examine Japan, which has an important place in the world in terms of earthquake resistance, and its policies.

3.4.1. Seismic history of Japan and Turkey

Seismic activity in and around Japan is very active. Because it is in an active plate boundary zone where four lithospheric plates meet one another and is one of the world's largest geological activity zones, named "Pacific Ring of Fire" (Map 3.6). The Japanese Islands in the Pacific Ocean where two oceanic plates are being subducted beneath two continental plates (Ishibashi, 2004). One-fifth of the earthquakes in the world occur in this region. Also, 10 percent of the world's earthquakes greater than magnitude 6.0 occur around Japan. (Ikegaya, 2013).

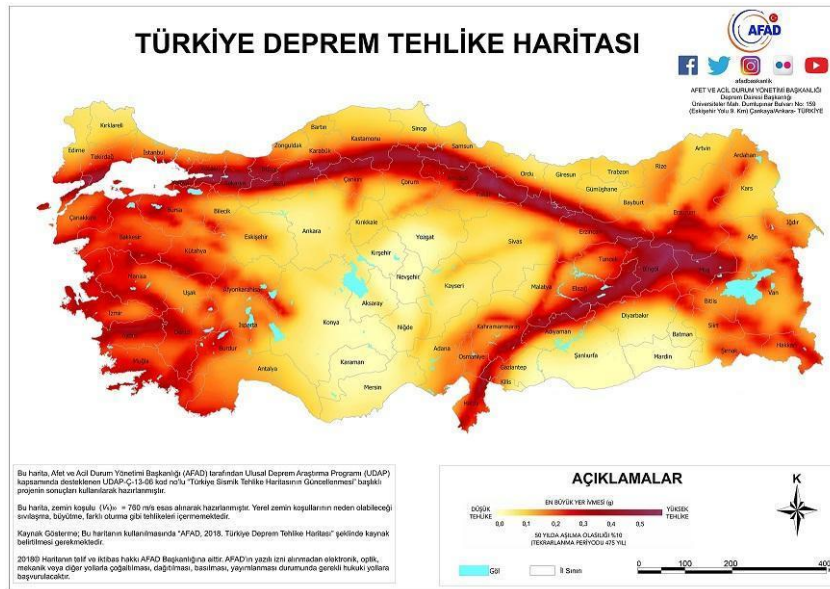


Map 3.6. Map of Pacific Ring of Fire (USGS, 2014).

Japan's seismic history dates to ancient times. However, due to the establishment of the modern state in 1868, that is, in the 19th century, in this study the major earthquakes from the 19th century to the present are examined.

When the Japanese modern government started in 1868, many foreign engineers, architects and researchers were invited to Japan to investigate the earthquakes. The Seismological Society of Japan (SSJ), the world's first academic community about earthquake research, was founded in Tokyo (Matsu'ura, 2017). At the Seismological Society of Japan, main research efforts were made by visiting researchers and engineers at the College of Engineering and the Tokyo University. The Seismological Society of Japan was renamed the Earthquake Research Committee in 1892 (Otani, 2008).

On the other hand, Turkey is in the Alp-Himalayan earthquake belt, which is one of the most important earthquake zones in the world. Anatolian Plate on which Turkey is located; It is surrounded by the Eurasian Plate in the north, the Africa and Arabian Plate in the south, the Eastern Anatolian Block in the east and the Aegean Block in the west. Due to this tectonic location, almost all of Turkey's lands are under earthquake risk. Looking at the historical earthquakes; It is observed that countless important earthquakes with loss of life and property are repeated especially in the North Anatolian fault, the Eastern Anatolian fault and the local faults in the Aegean region (Map 3.7) (Bikçe, 2015).



Map 3.7. Earthquake Hazard Map of Turkey (AFAD, 2018).

1891 Nobi (Mino-Owari) earthquake

On October 28, 1891, one of the most powerful earthquakes of modern Japanese history occurred in Japan (Gregory Clancey, 2006). This earthquake is still considered one of the

biggest earthquakes in modern Japanese history, causing damage over an area of 4,200 square miles (Milne, 1894). Although today's seismologists cannot tell the exact magnitude of the earthquake because the Richter scale was not discovered at that time, they think that its magnitude was approximately 8.4 (G. Clancey, 2006). The earthquake killed more than 7,273 people and injured more than 17,000 in sparsely populated areas. In Nagoya, 142,177 houses collapsed and 80,184 were heavily damaged, and even factories and buildings using brick materials were badly damaged (Figure 3.7, 3.8) (Table 3.2) (Otani, 2008).

Table 3.2. The number of deaths, injuries and damage in Nobi Earthquake

1891 NOBI EARTHQUAKE	
DEAD NUMBER	7,273
NUMBER OF INJURED	17,000
COLLAPSED BUILDINGS	142,177
HEAVILY DAMAGED	80,184



Figure 3.7. Nagara Gawa railway bridge after 1891 Nobi Earthquake (Milne, 1894)



Figure 3.8. Damage of new brick factory in 1891 Nobi Earthquake (Otani, 2008)

1923 Great Kantō earthquake

The Great Kanto Earthquake occurred in Japan (M 7.8 / 7.9, Ms 8.2) at noon on September 1, 1923 (Reitherman, 2008). The earthquake occurred along the Sagami Trough, about 100 km from Tokyo (Otani, 2008). The earthquake caused significant damage in Tokyo and Yokohama areas (Table 3.3) (Figure 3.9) (Otani, 2000).

Table 3.3. The number of deaths, injuries and damage in Great Kantō Earthquake

1923 GREAT KANTŌ EARTHQUAKE	
DEAD NUMBER	100,000
NUMBER OF MISSING	40,000
COLLAPSED BUILDINGS	250,000
DAMAGED BY FIRE	450,000



Figure 3.9. Metropolitan Police Office burning after the 1923 Great Kanto Earthquake (Wikipedia.com).

1948 Fukui earthquake

On June 28, 1948, the Fukui Earthquake occurred in the province of Fukui, in the northeastern part of Southwest Japan. The magnitude of this earthquake was 7.1 (Table 3.4) (Figure 3.10, 3.11) (Ishiyama, 2011).

Table 3.4. The number of deaths, injuries and damage in Fukui Earthquake

1948 FUKUI EARTHQUAKE	
DEAD NUMBER	3,895
COLLAPSED BUILDINGS	36,184
PARTIAL COLLAPSED	11,816
DAMAGED BY FIRE	3,851



Figure 3.10. Daiwa Department Store After the Fukui Earthquake (Wikipedia.com)



Figure 3.11. Daiwa Department Store After the Fukui Earthquake (Wikipedia.com).

1968 Tokachi-Oki earthquake

On May 16, 1968, the Tokachi-Oki earthquake of 7.9 magnitude occurred off the Pacific coast of northern Japan (off the coast of Tokachi, Hokkaido). And it caused massive damage to buildings, natural slopes, embankments, earthen dams, and port facilities (Table 3.5) (Figure 3.12) (Yoshimi, 1970).

Table 3.5. The number of deaths,injuries and damage in Tokachi-Oki Earthquake

1968 TOKACHI-OKI EARTHQUAKE	
DEAD NUMBER	48
COLLAPSED BUILDINGS	676
MODERATELY DAMAGED	2,984
SLIGHTLY DAMAGED	15,483



Figure 3.12. A Damage image from 1968 Tokachi-Oki Earthquake (JST, 2017).

1978 Miyagiken-Oki earthquake

On Monday, June 12, 1978, a devastating 7.4 magnitude earthquake hit the east coast of Miyagi Prefecture. The epicenter of the earthquake was located at 38 ° 9'N latitude, 142 ° 13'E longitude and 30 km depth. Several aftershocks continued to be felt over the next 4 days (Table 3.6) (Figure 3.13, 3.14, 3.15) (Brady, 1980).

Table 3.6. The number of deaths,injuries and damage in Miyagiken-Oki Earthquake

1978 MIYAGIKEN-OKI EARTHQUAKE	
DEAD NUMBER	27
NUMBER OF INJURED	1,600
COLLAPSED BUILDINGS	803
MODERETLY DAMAGED	5,227
SLIGHTLY DAMAGED	58,927



Figure 3.13. Obisan Building, Damage from 1978 Miyagi Ken Earthquake (Brady, 1980).



Figure 3.14. Paloma Buildings, Damage from 1978 Miyagi Ken Earthquake (Brady, 1980).



Figure 3.15. Yazaki Industries, Damage from 1978 Miyagi Ken Earthquake (Brady, 1980).

1995 Great Hanshin earthquake

On January 17, 1995, a major earthquake measuring 7.2 on the Richter scale occurred in the western part of Japan. The epicenter of the earthquake was the city of Kobe. The areas most severely damaged by the earthquake were in the southern part of Hyogo prefecture (Table 3.7) (Figure 3.16, 3.17) (Okimura, Takada, & Koid, 1996).

Table 3.7. The number of deaths, injuries and damage in Great Hanshin Earthquake (Chung, 1996).

1995 GREAT HANSHIN EARTHQUAKE	
DEAD NUMBER	~6,000
NUMBER OF INJURED	~30,000
COLLAPSED BUILDINGS	+150,000
TOTAL DAMAGED	~390,000



Figure 3.16. Collapsed Building in 1995 in Great Hanshin Earthquake (Holzer, 1999).



Figure 3.17. Collapsed Wooden Building and Apartment Building in 1995 in Great Hanshin Earthquake (Muguruma, Nishiyama, & Watanabe, 1995).

2011 Great east Japan earthquake

On March 11, 2011, a 9.0 magnitude earthquake occurred in the Pacific Ocean off the Tohoku region of Japan. Half an hour later, a tsunami hit the coastline and flooded more than 500 square kilometers (km²) of land (Table 3.8) (Figure 3.18, 3.19) (Ranghieri & Ishiwatari, 2014).

Table 3.8. The number of deaths, injuries and damages in Great East Japan Earthquake

2011 GREAT EAST JAPAN EARTHQUAKE	
DEAD NUMBER	18,571
NUMBER OF INJURED	6,150
NUMBER OF MISSING	2,651
COLLAPSED BUILDINGS	126,602
HALF COLLAPSED	272,426
PARTIALLY DAMAGED	743,089



Figure 3.18. Destroyed buildings picture due to the 2011 Great East Japan Earthquake (Taylor, 2011).

Another serious impact of the earthquake and tsunami was the nuclear crisis. Despite all the measures taken, the crisis gradually became a level 7 nuclear event. The Nuclear crisis and its aftermath aroused public concerns about nuclear energy in Japan and other earthquake prone countries (Zaré & Afrouz, 2012; Norio, Ye, Kajitani, Shi, & Tatano, 2011).



Figure 3.19. A Damage image from 2011 Great East Japan Earthquake (Pletcher, 2011).

1939 Erzincan earthquake

On December 27, 1939, a large earthquake of 7.9 magnitude occurred in the city of Erzincan. With this feature, it is described as the biggest earthquake among the earthquakes that have occurred in Anatolia since the 19th century (Table 3.9) (Figure 3.20, 3.21) (Bikçe, 2015).

Table 3.9. The number of deaths, injuries and damages in Erzincan Earthquake

1939 ERZINCAN EARTHQUAKE	
DEAD NUMBER	32,672
COLLAPSED BUILDINGS	116,720



Figure 3.20. Damage from 1939 Erzincan Earthquake (William, Pomonis, Booth, & Ring, 1992).



Figure 3.21. Damage from 1939 Erzincan Earthquake (William, Pomonis, Booth, & Ring, 1992).

1944 Bolu earthquake

On February 1, 1944, a devastating 7.4 magnitude earthquake occurred with the epicenter of Bolu Gerede region. The earthquake occurred in an area of 200 km long and 25 km wide from Abant to Ilgaz (Table 3.10) (Figure 3.22) (Özçelik, 2017).

Table 3.10. The number of deaths, injuries and damages in Bolu Earthquake

1944 BOLU EARTHQUAKE	
DEAD NUMBER	3,959
NUMBER OF INJURED	2,725
COLLAPSED BUILDINGS	8,951
HEAVILY DAMAGED	10,391



Figure 3.22. Damage from 1944 Bolu Earthquake (Bilgipedia, n.d.).

1966 Varto earthquake

On 19 August 1966, a severe earthquake of 6.8 magnitude occurred in Varto (Muş), which was felt over an area of approximately 300,000 square kilometers. Numerous aftershocks were felt in the days following the main shock; some of these caused additional damage (Table 3.11) (Figure 3.23) (Ambraseys & Zátópek, 1968; Bikçe, 2015).

Table 3.11. The number of deaths, injuries and damages in Varto Earthquake

1966 VARTO EARTHQUAKE	
DEAD NUMBER	2,394
NUMBER OF INJURED	1,370
HEAVILY DAMAGED	36,927



Figure 3.23. Regional Hospital Building after 1966 Varto Earthquake (Ambraseys & Zátópek, 1968).

1975 Lice earthquake

On September 6, 1975, an earthquake of 6.9 magnitude occurred just a few kilometers northeast of the epicenter Lice. The main shock was felt over an area of 210,000 square kilometers. The aftershocks lasted about a month. Smaller aftershocks on September 25 caused additional damage and multiple casualties (Table 3.12) (Figure 3.24) (Bikçe, 2015).

Table 3.12. The number of deaths, injuries and damages in Lice Earthquake

1975 LİCE EARTHQUAKE	
DEAD NUMBER	2,385
NUMBER OF INJURED	3,339
HEAVILY DAMAGED	19,982



Figure 3.24. Completely Destroyed Police Building in 1975 Lice Earthquake (Mitchell, 1976).

1999 Marmara earthquake

On August 17, 1999, at 03:02 local time, an earthquake with Magnitude Md: 6.7 (Duration size), Mw: 7.4 (Moment Magnitude) occurred on the southeast of Kocaeli (Izmit) city center. The cities of Bursa, Bolu, Eskişehir, Tekirdağ and Zonguldak, especially Istanbul, Sakarya and Yalova, were also affected by this earthquake (Table 3.13) (Figure 3.25, 3.26, 3.27) (Özmen, 2000).



Figure 3.25. Totally Collapsed in 1999 Marmara Earthquake (Koç, 2016).

Table 3.13. The number of deaths, injuries and damages in Marmara Earthquake

1999 MARMARA EARTHQUAKE	
DEAD NUMBER	17,479
NUMBER OF INJURED	43,953
HEAVILY DAMAGED	77,432
MODERATE DAMAGED	77,169
SLIGHTLY DAMAGED	89,872



Figure 3.26. Tilted Buildings in 1999 Marmara Earthquake (Koç, 2016).



Figure 3.27. Collapsed Building in 1999 Marmara Earthquake (Karaşin ve Karaesmen, 2005).

2011 Van earthquake

On October 23, 2011, at 13:41 local time, an earthquake with a moment magnitude (M_w) varying between 7.1 and 7.3 according to different organizations, caused significant damage in the city center of Van as well as in Erciş and the surrounding area. The center of the earthquake that occurred is north of Van provincial sound and its exact position is listed according to different institutions. Along with the aftershocks, the Van-Edremit Earthquake, which was caused by a different fault with a size of M_w 5.7 on 9 November 2011 which increased the loss of life and property (Figure 3.28).



Figure 3.28. Collapsed Building in 2011 Van Earthquake (Güney, 2011).

Table 3.14. The number of deaths, injuries and damages in Van Earthquake

2011 VAN EARTHQUAKE	
DEAD NUMBER	644
NUMBER OF INJURED	252
HEAVILY DAMAGED	14,776
MODERATE DAMAGED	11,595

2020 Elazığ & İzmir earthquakes

On Friday, 24.01.2020, at 20:55 local time, M_w 6.8 (ML 6.6) magnitude Elazığ-Sivrice earthquake occurred. Elazığ-Center and Sivrice, Malatya-Kale, Pütürge and Doğanyol

districts were particularly affected by the earthquake. After the main shock, which occurred at 20:55, 23 aftershocks with magnitudes ranging from 4 to 5.1 were recorded (Table 3.15) (Figure 3.29) (Mertol, 2020).



Figure 3.29. Collapsed Building in 2020 Elazığ Earthquake (Mertol, 2020).

Table 3.15. The number of deaths, injuries and damages in Elazığ Earthquake

2020 ELAZIĞ EARTHQUAKE	
DEAD NUMBER	41
NUMBER OF INJURED	1,600
COLLAPSED BUILDINGS	596
HEAVILY DAMAGED	10,879
MODERATE DAMAGED	2,052

On October 30, 2020, at 14:51, an earthquake with a magnitude of Mw 6.6 (AFAD), Mw 6.9 (Kandilli Observatory and Earthquake Research Institute) occurred off the epicenter of Izmir Seferihisar in the Aegean Sea (17.26 km). After the main shock at a depth of 16.54 km, numerous aftershocks occurred (Table 3.16) (Figure 3.30, 3.31) (Deniz, 2020).

Table 3.16. The number of deaths, injuries and damages in İzmir Earthquake

2020 İZMİR EARTHQUAKE	
DEAD NUMBER	117
NUMBER OF INJURED	1032
HEAVILY DAMAGED	376
MODERATE DAMAGED	410
SLIGHTLY DAMAGED	4,182



Figure 3.30. Collapsed Building in 2020 İzmir Earthquake (Deniz, 2020).



Figure 3.31. Collapsed Building in 2020 İzmir Earthquake (Deniz, 2020).

3.4.2. Building/earthquake codes change in Japan and Turkey

Building codes are regulations aimed at increasing the resilience of the built environment to reduce the harmful effects of earthquakes and other natural disasters (Table 3.17 and 3.18).

Table 3.17. Building and Earthquake Changes in Japan

Name of Code	Earthquake	Year
Urban Building Law was entered into force. A year later this law was revised.	Nobi Earthquake (1891)	1919-1920
Earthquake resistant construction regulations were introduced. This was the first such requirement in the World.	Kanto Earthquake (1923)	1924
The introduction of the Building Standards Act and what is now known as “kyu-taishin”.	Fukui Earthquake (1948)	1950
Amendments to the Act for shearing reinforcement and reinforced concrete foundations.	-	1971
The “shin-taishin”, or New Earthquake Resistant Building Standard Amendment.	Miyagi Earthquake (1978)	1981
The Retrofit Promotion Act was enforced	Great Hanshin Earthquake (1995)	1995

Table 3.17. (Continue) Building and Earthquake Changes in Japan

Name of Code	Earthquake	Year
Building Standard Law was revised	Great Hanshin Earthquake (1995)	1998
<ul style="list-style-type: none"> •Revision to improve earthquake resistance for wooden structures. •Introduction of the 10-Year Warranty Against Defects. •Response and Limit Deformation”, was introduced 	Great Hanshin Earthquake (1995)	2000
Building certificates and inspections became stricter for apartment buildings over 3-storeys in the middle of construction.	Great Hanshin Earthquake (1995)	2006

Nobi earthquake

After the Nobi earthquake disaster in Japan, brick and masonry construction has been associated with insecurity and is generally banned in Japan. Later, The Association for Earthquake Disaster Reduction Investigation was organized by the Japanese government in 1892 to develop measures to increase the earthquake resistance of building construction (Otani, 2000).

Later, Dr. Sano published "Earthquake Resistance of Buildings" in 1914, in which he proposed the use of equivalent static horizontal loads in the seismic design of buildings and suggested a seismic coefficient of 0.3 in downtown Tokyo. He also drew attention to the importance of strength, ductility and stiffness of structural elements (Otani, 2000).

In April 1919, Japan's first building code, "Urban Building Law," entered into the regulation of buildings in six major cities (Tokyo, Yokohama, Nagoya, Kyoto, Osaka, and Kobe). The following year, in November 1920, a new revision was put into effect for wood, masonry, brick, reinforced concrete and steel structures (Ishiyama, 2011; Otani, 2000).

Kanto earthquake

After this earthquake, the Urban Building Law Enforcement Regulations were revised in June 1924. In this revision, it was introduced the use of a seismic coefficient of 0.10 in structural design. The maximum ground acceleration of 0.3 G was estimated in downtown Tokyo during the Kanto Earthquake. In case of a strong earthquake, it was judged acceptable to rely on the full material strength to resist disturbances. Therefore, the design seismic coefficient was determined by dividing the estimated maximum ground acceleration of 0.3 G by the safety factor of 3.0 to yield 0.10. The regulations further specified minimum lap splice length for reinforcing bars, use of top and bottom reinforcement in girders, and minimum dimensions and reinforcement of columns (Otani, 2008).

World War II after the great earthquake had a significant impact on building construction throughout Japan. In a part of this period, some stretches were made in the regulation due to the shortage of construction materials. In 1943, the City Development Law was completely suspended except for some fire restrictions. During World War II, bombings (especially cities where atomic bombs were used) heavily affected many Japanese cities.

Fukui earthquake

After the Fukui Earthquake, the Urban Building Law was restored shortly after. However, the Building Standards Law, which applies to all buildings in Japan, was promulgated in May 1950. The purpose of the law is to protect people's life, health and property by meeting the minimum standards regarding site, structure, equipment and use. This law was applicable to building construction throughout Japan as opposed to restricted territories. According to this new law, the seismic coefficient was increased from 0×1 to 0×2 . Since there is a simultaneous increase in allowable stresses for the materials, the net effect on proportioning materials was minimal (Otani, 2000; Whittaker, Moehle, & Higashino, 1998).

As a result of the damage in this earthquake, the demolition of the reinforced concrete buildings that were previously trusted for earthquake resistance (although no one was killed) raised some doubts about the earthquake resistance of the reinforced concrete structure (Ishiyama, 2011). As a result of this situation, in 1971, a partial revision of the Building Standards Act and a large-scale revision of the AIJ RC Standards were made, which included the shear design for reinforced concrete buildings (Hiroshi, 2006).

Miyagiken earthquake

This earthquake accelerated the implementation of the "new seismic design method for buildings" proposed by the Ministry of Construction in 1977. In July 1980, the Enforcement Order of the Building Standard Law was revised. As of June 1, 1981, the revised seismic design code entered into force. The main feature of the revised seismic design code was the introduction of a two-stage earthquake design concept. Phase one targeted the safety and serviceability of buildings during moderate and mild earthquakes. The second phase was the addition of a secondary earthquake design to provide security against severe earthquakes (Hiroshi, 2006).

Great east Japan earthquake

The earthquake caused a large number of people to die and buildings to collapse seriously; In a sense, it is a lecture-type disaster for scientists, architects and engineers in the subjects of earthquake preparedness, disaster response, seismic design, improvement of existing buildings and the introduction of new technologies, which provide high security levels of buildings against destructive earthquakes. And for the future, the need for next-generation seismic design has led to the development of performance-based engineering specifically addressing life safety, repairability and functionality (Hiroshi, 2006).

After the 1995 Hyogo-ken Nanbu earthquake, the Building Standard Law was revised again in 1998 after the earthquake and another seismic design method, "Response and Limit Deformation", was introduced in 2000. The revision's aim was to make minor amendments to the new seismic design method and also was to introduce performance-based "Response and Limit Capacity Method" (Ishiyama, 2011; Teshigawara, 2012).

Table 3.18. Building and Earthquake Changes in Turkey

Name of Code	Earthquake	Year
During this period when masonry structures were common, the regulation generally focused on architectural issues. Although 1st and 2nd degree earthquake zones are mentioned.	Bolu Earthquake	1947
The calculation of earthquake forces was given in more detail and tables were prepared. With more emphasis on ground, ground safety stress values have also been determined for various classes of grounds.		1953
According to the previous regulation, there were no major changes, and the earthquake force calculation was more advanced. In addition, flood and fire disasters		1962

Table 3.18. (Continue) Building and Earthquake Changes in Turkey

<p>were mentioned.</p> <p>Unlike the previous regulations, a part of this regulation is devoted to the issues about the structures to be built in earthquake zones.</p>		1962
<p>In addition to earthquakes, some recommendations have been made regarding protection from floods and fire disasters. In our country, where reinforced concrete buildings have gained importance, the general characteristics of reinforced concrete building elements are mentioned, and the rules regarding size and reinforcement are included.</p>	Varto Earthquake (1966)	1968
<p>The country is divided into 1st, 2nd, 3rd and 4th degree earthquake zones. Now, reinforced concrete buildings</p>	Lice Earthquake (1975)	1975

Table 3.18. (Continue) Building and Earthquake Changes in Turkey

dominate the building population. The dimensions and reinforcement values given for reinforced concrete elements are at a level that can be called sufficient in earthquakes.	Lice Earthquake (1975)	1975
The regulation dealt with issues called irregularities for earthquake resistant building design. It defined the horizontal and vertical irregularities of the building, and these rules were requested to be followed during the design to be able to determine the loads to the structure in a realistic way, it must first be regular in terms of dimensions and position of the elements		1998
Compared to other	Marmara Earthquake (1999)	2007

Table 3.18. (Continue) Building and Earthquake Changes in Turkey

<p>regulations, performance-based analysis methods have been made mandatory in evaluating and strengthening existing buildings. 6 different soil classes have been accepted. Soil liquefaction risk under earthquake effect has been studied more comprehensively.</p>	<p>Marmara Earthquake (1999)</p>	<p>2007</p>
<p>•According to the provisions of the regulation, the design of new buildings under the effect of earthquake, their current evaluation and strengthening are made.</p> <p>•The provisions of the regulation are applied for the design of buildings made of reinforced concrete, steel, masonry and</p>	<p>Van Earthquake (2011)</p>	<p>2018</p>

Table 3.18. (Continue) Building and Earthquake Changes in Turkey

<p>and wooden materials under the influence of earthquakes.</p> <p>•Special rules are determined in the relevant section of the regulation for the design of high-rise buildings and insulated structures under the effect of earthquakes.</p> <p>•Special rules for the evaluation and strengthening of existing buildings under the effect of earthquakes are defined in the relevant part of the regulation.</p>	Van Earthquake (2011)	2018
---	-----------------------	------

Erzincan earthquake

The Erzincan earthquake was a milestone for the earthquake resistant design concept to start in Turkey. As a result, the first legal provisions for earthquake resistant design were established by the Ministry of Public Works in 1940 (Ilki & Celep, 2012). On 17 January 1940, the "Law on Erzincan Earthquake Area Aid" numbered 3773 was published. This law is Turkey's first post-disaster law (Soyluk & Harmankaya, 2012).

The previous seismic regulation was revised in 1944 within the articles of Law No. 4623 as a result of the earthquake. The law stated that any building built without complying with the requirements of the regulation would be demolished. However, this regulation (and its future versions) did not clearly state which authority is to do the demolition, therefore consequently no demolition was done (Gülkan, 2000; Ilki & Celep, 2012).

Bolu earthquake

The regulation in the seismic code was updated in 1949 and 1953 (after the Yenice Earthquake) to show changes in the seismic zone map without major changes in the regulation. With the establishment of the Ministry of Reconstruction and Resettlement in 1958, the disaster prevention policy was updated and in 1961 the seismic regulation passed a revision including the formulation of the base shear coefficient (Gülkan, 2000).

Lice earthquake

As a result of the earthquake, the seismic regulation was revised again in 1975. The new seismic code brought significant improvements to seismic design and introduced international developments to the engineering community in Turkey. The code was the first to use the term "ductility" explicitly. In addition, the basic shear force has been given for the first time as a function of structural ductility according to the lateral load resistance system of the structure by introducing a structure type coefficient. The 1975 Seismic Regulation remained valid until the 1998 revision (Ilki & Celep, 2012).

Marmara earthquake

In 2007, 8 years after the earthquake, the 1998 seismic regulation was revised to ensure the rehabilitation of buildings. And a new section titled "Seismic Assessment and Rehabilitation of Existing Buildings" has been added (Soyluk & Harmankaya, 2012).

Van earthquake

After the earthquake, 2018 TBDY (Turkey Building Earthquake Regulation), which is under preparation, was published in the Official Newspaper No. 30364 dated March 18, 2018 and

accepted to be implemented as of January 1, 2019. With the concept of seismic hazard analysis included in the 2018 earthquake regulation, there have been significant changes in earthquake loads affecting buildings, especially in the provinces located in the fourth-degree earthquake zone in the previous regulations (Keskin & Bozdoğan, 2018).

As can be seen, after the earthquakes in both countries, changes and revisions were made in the earthquake regulations. In Japan, the regulations were changed 6 times and additional articles and laws were added 5 times. In Turkey, earthquake regulations have been changed 7 times in total. In Japan, after 1981, an earthquake regulation developed on the new earthquake regulation, which has survived to the present day with the addition of only some articles. After two devastating earthquakes in 1995 and 2010, additional articles were added to the regulation, which did not change completely. This shows that since 1981, a more established and more robust understanding of earthquake regulation has been adopted in Japan. In Turkey, earthquake regulations changed 6 times until the 1999 earthquake. The 1999 Marmara Earthquake, on the other hand, was a turning point in the history of Turkey that caused the earthquake regulations to be reconsidered and is remembered even today. After the earthquake, additional articles were added to the regulation, but the main revision was made in 2007. It was updated again in 2018, 7 years after the Van earthquake in 2011. Today, this regulation is still in effect. However, the Elazığ and İzmir earthquakes, which are also mentioned in this study, have caused the regulation to be questioned again.

3.4.3. Disaster management change in Japan and Turkey

Disaster management is a very broad concept that requires the management of resources in line with these common goals with the participation of all institutions and organizations of the society to plan, direct, coordinate, support and implement the works to be carried out before and after disasters in order to prevent disasters and reduce disaster damages. Disaster management: It is an issue that needs to be addressed with the joint work of more than one discipline. Because possible effects and consequences of disasters concern all segments of the society requires unity and common struggle. Therefore, all segments of society and international organizations, including public institutions and organizations, private sector, academic institutions, non-governmental organizations, media and individuals, are also involved in disaster management.

3.4.4. Disaster management in Japan

After the late 1940s, laws on disaster management began to be developed in Japan. The current emergency management system in Japan began in 1961 with the enactment of the Disaster Prevention Basic Act. And it reflected lessons learned from earthquakes and other disasters since then.

National policy, strategy and legislation in disaster risk reduction of Japan

According to the Disaster Countermeasures Basic Act, the State is responsible for the preparation and implementation of disaster prevention, response and recovery plans (Figure 3.32) (OECD, 2009).

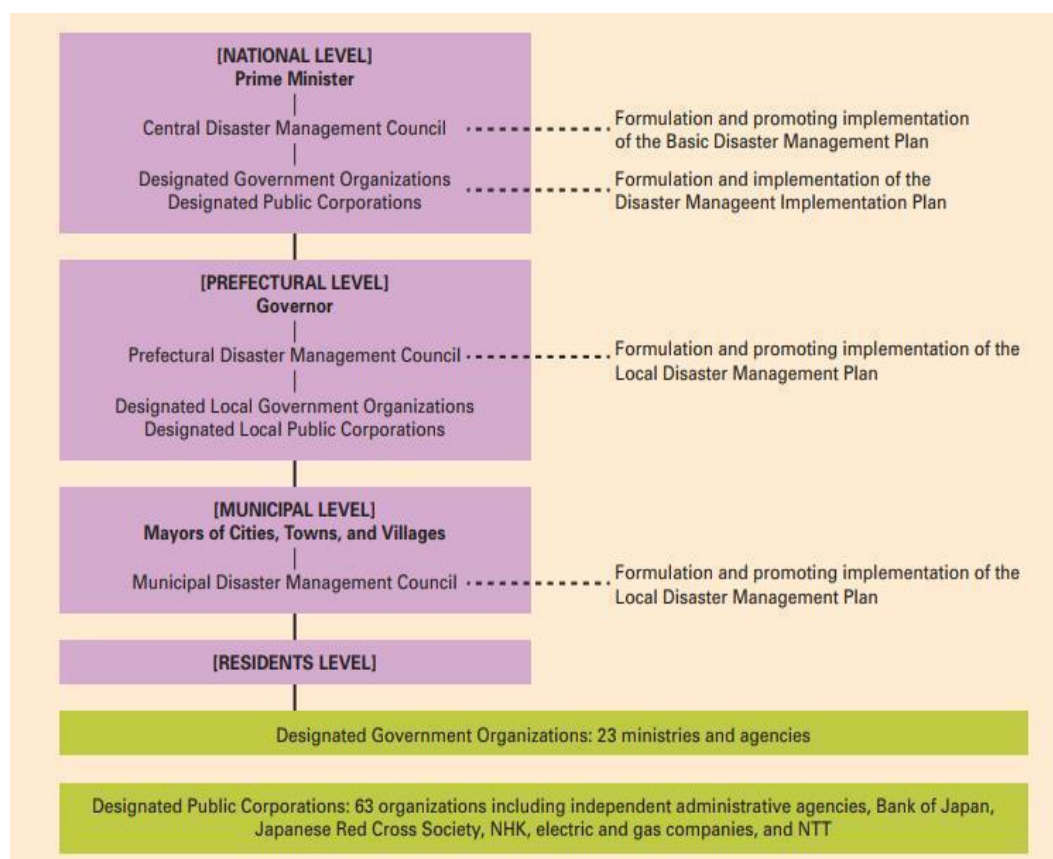


Figure 3.32. Outline of Japan's disaster management system (Ikeda, 2012)

National government level

The Central Disaster Prevention Council, convened under the chairmanship of the Minister of Interior, is responsible for the preparation of disaster prevention plans and the general planning for preparations. The Council works on coordination and institutional appointment, assignments and plan decisions rather than operational planning regarding disasters. The organization responsible for operations at the national level and making decisions and plans related to them is the appointed management bodies and public organizations. These are the basic elements of operational planning and these institutions are responsible to the Central Disaster Prevention Council (Erkal & Değerliyurt, 2009).

Regional government level

The Regional Governor is responsible for the coordination, implementation and extension of the operations. He chairs the Regional Disaster Prevention Council. The Regional Disaster Prevention Council carries out its planning activities in accordance with the general decisions and framework at the national level. Responsible for making decisions. In addition, it decides the responsibilities to be undertaken by regional executive bodies and regional public organizations and makes the necessary appointments (Erkal & Değerliyurt, 2009).

Municipal level

It is responsible for making all kinds of preparations against the possibility of a disaster, to prepare for and execute operations. It is valid for any unit with a municipal organizational structure. The Municipal Disaster Prevention Council is responsible for disaster preparations and measures within the boundaries of the municipality, chaired by the mayor (Erkal & Değerliyurt, 2009).

People-individual level

The individual level of the National Emergency Management Model aims to make the society resistant and prepared for disasters, and to be in coordination with neighborhood organizations and other voluntary organizations (Erkal & Değerliyurt, 2009).

Countermeasures for earthquake

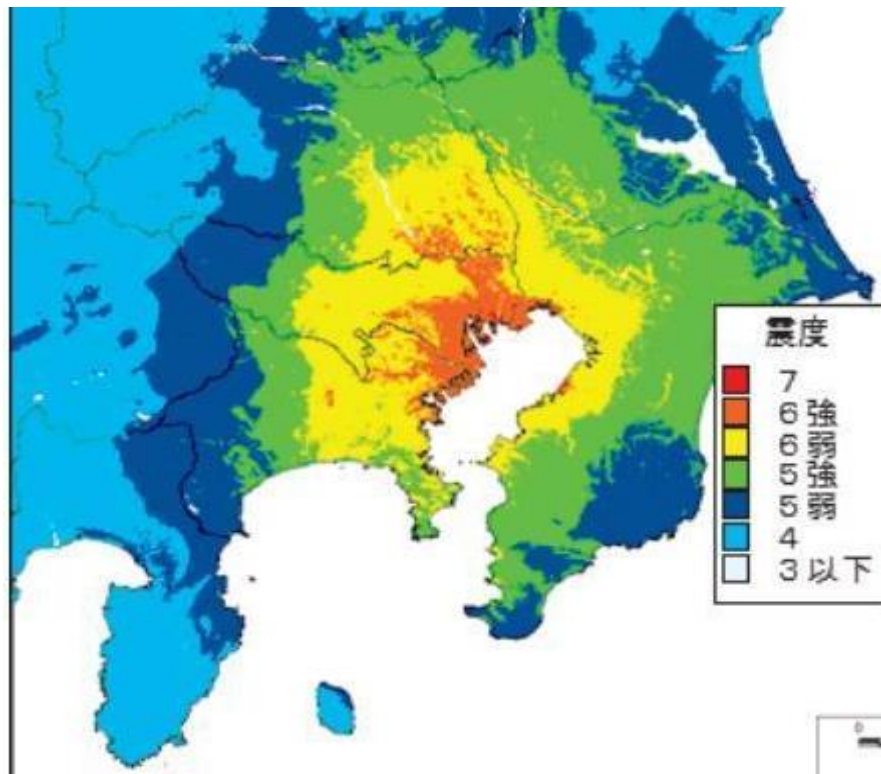
The Government of Japan prepared disaster plans and developed individual measures to prepare for major earthquakes that could occur along the Nankai Trench, which stretches from the Suruga Bay to the Shikoku offshore and the Hyuga Sea. They divided these probable earthquakes into Tokai and Tonankai / Nankai earthquakes and Tokyo Inland Earthquakes based on the differences, including the risk of proximity (Cabinet Office, 2015).

Special measures act on measures for Nankai trough earthquakes

After the 2011 Great East Japan Earthquake, the Special Measures Act on Measures for Tonankai and Nankai Earthquakes (Law No. 92) was amended in November 2013 to comprehensively improve both structural and non-structural earthquake DRR (Disaster Risk Reduction) measures (Cabinet Office, 2015).

Tokyo inland earthquake measures

Based on the Tokyo Internal Earthquake Mitigation Outline approved by the Central Disaster Management Council in September 2005, various types of activities have been developed to prepare for earthquakes directly in the Tokyo Metropolitan Area. In this context, earthquake and tsunami patterns were studied based on the latest scientific findings, including the possibility of a major earthquake along the Sagami Trench (Map 3.8) (Cabinet Office, 2015).



Map 3.8. Distribution map of seismic intensity of earthquake directly under southern Tokyo in Japan (Cabinet Office, 2015).

Act on special measures against Tokyo inland earthquake

The Act on Special Measures against Tokyo Inland Earthquake, a part of a law that entered into force in November 2013, for Tokyo to plan the continuation of the capital's basic functions in the event of a possible earthquake and to protect the lives in the event of earthquake.

This law establishes the Emergency Measures Implementation Plan, which includes emergency measures for possible earthquakes in the capital, determining the importance of basic guidelines and measures to be taken. In addition, the law contains regulations for the regulation of necessary infrastructure developments (Cabinet Office, 2015).

Earthquake early warning systems in Japan

The Earthquake Early Warning (EEW) Program is a system that aims to quickly determine the magnitude and epicenter of the earthquake. In this system, the Japan Meteorological

Agency (JMA) quickly determines the hypocenter (earthquake epicenter and focal point) using real-time data from stations near the hypo-base. The collected data and information are communicated to government officials, representatives of various industries, the media, and therefore the public, just before the earthquake occurs (Figure 3.33). (Hoshiba, Kamigaichi, Saito, Tsukada, & Hamada, 2008).

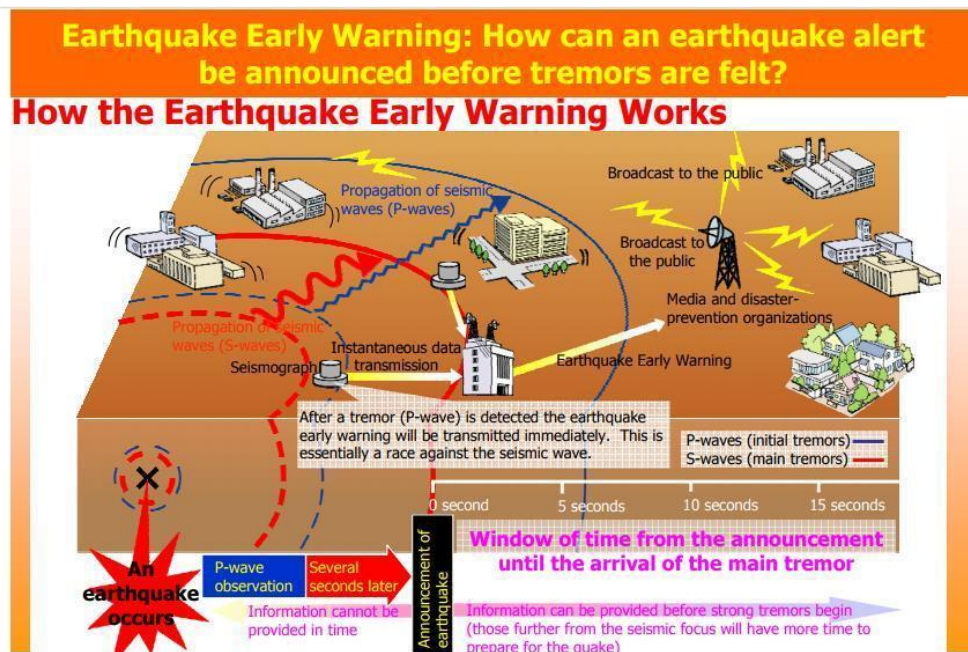


Figure 3.33. Outline of Earthquake Early Warning System (JMA, 2006).

EEW applications can be examined in two categories as specific disaster prevention systems and data transmission media. The first includes the development of the EEW system in firefighting systems, medical systems, home electronics systems, school systems, factory systems, liquefied petroleum gas (LPG) systems, outdoor activity systems, building maintenance systems, elevator systems, and dam maintenance systems. Data transmission is disaster prevention wireless systems, IP phone systems, general mobile communication systems and FM broadcast systems (Fujinawa & Noda, 2013).

3.4.5. Disaster management in Turkey

Disaster management systems and implemented national strategies in Turkey have periods of significant policy changes over time. These differ from each other as before 1944, between 1944 and 1958, between 1959 and 2009, and after 2010.

Before 1944 disaster management in Turkey

From the establishment of the Republic of Turkey in 1923 to the mid-1940s, natural disaster response and recovery activities were carried out by the "Turkish Red Crescent Association" (Gökçe & Tetik, 2012).

The general characteristics of this period, which continued until 1944, are as follows:

- a) A disaster policy has not been developed in line with the settlement, housing and industrialization policies of the country regarding the reduction of disaster damages.
- b) In this period, it is seen that studies that can be regarded as disaster mitigation studies have not started yet.
- c) In this period, effective strategies and policies for disaster mitigation, preparedness, rescue and reconstruction activities were not produced (Yılmaz, 2003).

1944-1958 period disaster Management

Between 1939 and 1944, there were earthquakes in which 44,000 people died, 100,000 people were injured, and hundreds of thousands of buildings were destroyed or damaged. As these earthquakes caused enormous loss of life and property in Turkey, the government of the period decided to make some new regulations in the country to reduce earthquake damages. And on July 22, 1944, a new legal regulation was enacted, numbered 4623, "Law on Measures to be Taken Before and After Earthquakes".

Its main purpose is to reduce the loss of life and property that may be caused by earthquakes, to organize the works to be done at the central and local level to be prepared for earthquakes, and to respond to earthquakes in a timely, fast and effective manner. This law briefly covers earthquake disaster mitigation, preparedness and emergency recovery activities. However, this law does not contain provisions regarding permanent settlement works. In addition, as a solution to this situation, separate disaster relief laws were chosen, depending on the social and economic structure of the region affected by natural disasters, as in the past.

1959 - 2009 period disaster Management

With the establishment of the Ministry of Reconstruction and Settlement, Turkey's activities regarding natural disasters have gained momentum. In 1959, various changes were made and

the Law No. 7269 “Regarding the Aid to Be Taken Due to Disasters Affecting the Public Life” was enacted. With this law, also known as the “Disasters Law”, many aid laws enacted in the modern period for disasters and their aftermath were gathered together, until that date, only earthquakes and flood reduction activities were expanded as effective natural disasters in Turkey and In order to reduce the damages of natural disasters, the work to be done before, during and after the disaster, at the central and local scale has been rearranged. With this new law, 9 aid laws, notably the law numbered 4623, were repealed. This law, which was considered as one of the most modern and comprehensive disaster laws in the international arena at the time of its enactment and taken as an example by many countries, was significantly implemented in 1968 with the law number 1051 in line with the experiences and new requirements from earthquakes, floods and landslides that were experienced intensely between 1960 and 1967. seven items were added.

Due to the problems encountered in coping with the heavy balance sheet encountered in the Marmara Earthquakes in 1999, it has revealed the necessity of re-questioning the Disaster Management System of Turkey and making new legal regulations. The 1999 Earthquake was a turning point in Turkey's disaster and earthquake management. In this sense, many Laws, Regulations, Decree Laws, communiqués and circulars have been issued. In this sense, 38 Laws and Decree Laws, 28 Degrees, 6 Regulations, 17 communiqués and 9 circulars were issued. Immediately after the Marmara earthquake, the Council of Ministers issued regulations covering the subjects of "Building Inspection", "Building Inspection Implementation Regulation", "Building Materials", "Building and Development in Regions Outside the Metropolitan Municipality Borders". These regulations aimed at "prevention", "risk reduction" and "damage reduction". However, most of these legal and administrative documents focused on issues related to post-disaster recovery and reconstruction phases. Legal and administrative changes to support a holistic and risk-based disaster management approach, which is an important need, could not be made. In this process, the effects of the transformation in international disasters policy were not reflected in Turkey intensely (Özmen & Özden, 2013).

Discussions on issues emerging after the 1999 earthquakes, the understanding that the measures to be taken in terms of institutional structuring and legislation should be taken urgently, and the need to rearrange the disaster management system have intensified. In particular, the necessity of a modern disaster management system has been emphasized

frequently, in line with the suggestions of academics, universities, media and non-governmental organizations. This issue was also emphasized in the final declaration of the "Earthquake Council" organized by the Ministry of Public Works and Settlement between September 29 - October 1, 2004. As a result, in 2009, the Law No. 5902 on the Organization and Duties of the Disaster and Emergency Management Presidency entered into force (Gökçe & Tetik, 2012). With this law, The “Disaster and Emergency Management Authority” (AFAD), affiliated to the Prime Ministry, was established to carry out services related to disasters and emergencies and civil defense (Özmen & Özden, 2013).

National policy, strategy and legislation in disaster risk reduction of Turkey

Turkey's previous disaster management structure (before 2009, was based on a number of different laws and regulations regarding disasters. Various government departments at the central, provincial, district and local levels deal with different aspects of disaster management. There was not a single national office with the authority. Instead, some central-level government units have coordination functions at different stages of disasters (Figure 3.34) (Ganapati, 2008).

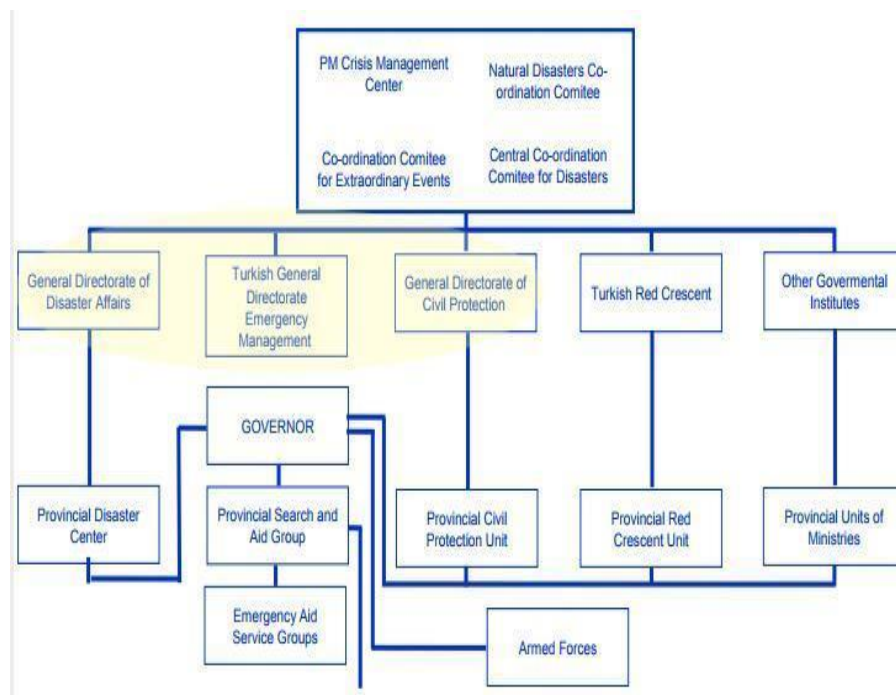


Figure 3.34. Disaster Management System Before 2009 (Kuterdem, 2010).

However, Turkey changed its disaster management structure by combining decision-making mechanisms, which were previously more than one, in 2009. The new organization was established within the Prime Ministry and was named the Disaster and Emergency Management Authority (AFAD).

AFAD;

- Pre-disaster studies such as preparedness, mitigation and risk management,
- Disaster synchronization studies such as intervention, emergency assistance,
- Recovery and reconstruction,

It is responsible for post-disaster studies such as, their implementation and coordination. The new law number 5902, enacted in 2009, explains the necessary administrative structure, activities, responsibilities, relations with other units and the execution of duties regarding disaster and emergency management of natural, technological and human-induced hazards. The purpose of this law,

- Taking necessary precautions and measures in disaster and civil protection related services on a country basis,
- Ensuring coordination between organizations that have a role in pre- and post-disaster activities,
- Establishing and implementing policies regarding disaster management (Kuterdem, 2010).

The Turkish Disaster Response Plan (TAMP) is a national disaster plan that was initiated by the Disaster and Emergency Management Authority (AFAD) in 2012 and was published in 2014 (Figure 3.35) (Şahin, 2020).

Purpose of TAMP; Defining the roles and responsibilities of service groups and coordination units that will take part in response activities in disaster and emergency situations, determining the basic principles of response planning before, during and after the disaster. The scope of the plan is; It has been defined as ministries, institutions and organizations, private organizations, NGOs (Non-governmental Organizations) and real persons who will take part in response to disasters and emergencies in all types and scales that may be experienced in Turkey (Şahin, 2020; TAMP, 2013).

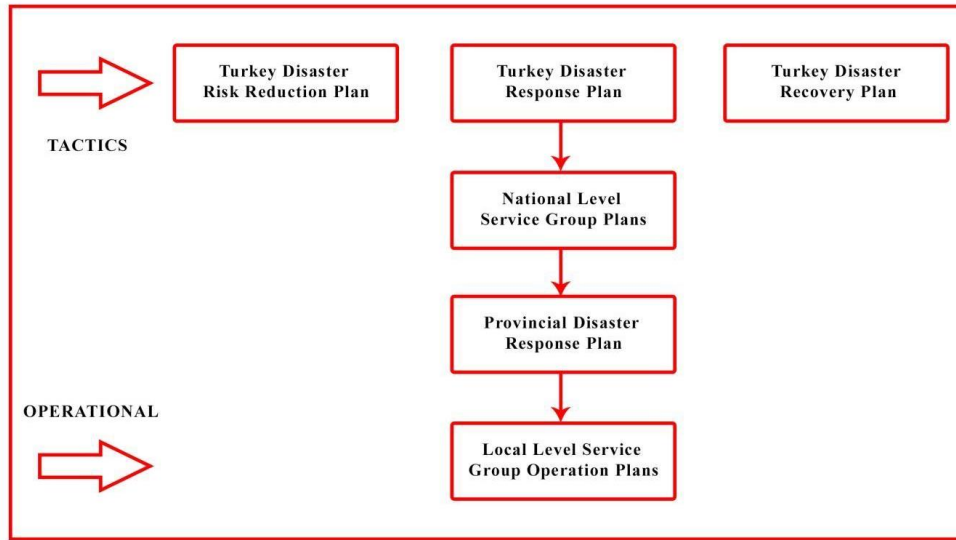


Figure 3.35. Turkey's Disaster Management Planning Approach (TAMP, 2013).

When TAMP is examined, the risk and damage reduction strategy and plan of TAMP before the disaster; There is also a post-disaster recovery strategy and plan. However, according to the statements made in the United Nations Global Platform for Disaster Risk Reduction, it is stated that both the Turkey Disaster Management Strategy Document (TAYSB) and the Turkey Disaster Risk Reduction Plan (TARAP) are not yet ready before the disaster of TAMP; It can be understood that the studies on these strategies and plans are continuing (Şahin, 2020; AFAD, 2019a).

Earthquake early warning systems in Turkey

With the decision of the Council of Ministers dated 2001, 10 strong ground motion stations were established by the Boğaziçi University Kandilli Observatory and Earthquake Research Institute (B.Ü.-K.R.D.A.E) within the scope of the "EU" leg of the Istanbul Earthquake Early Warning and Emergency Response Project (Alçık, 2011). For the locations of the stations, Islands, Tuzla, Darıca, Yeşilköy, Yalova, Gebze and Marmara Ereğlisi regions were determined. The warning signal for an earthquake that may cause damage can be given at most 8 seconds before, depending on the earthquake source parameters and the coordinates of the location to be affected (Figure 3.36) (Erdik et al., 2003).

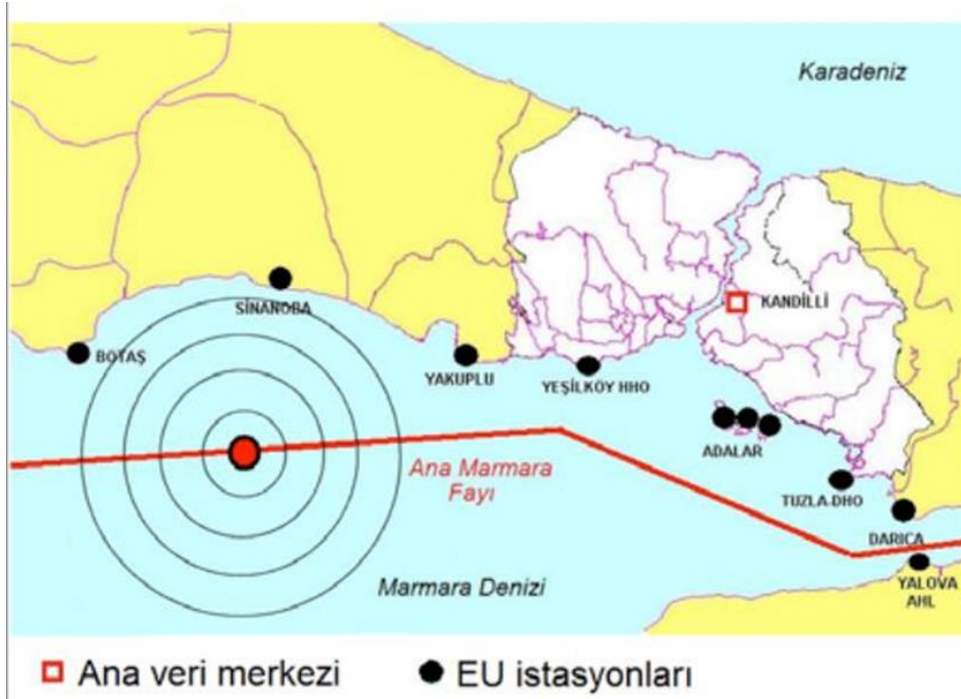


Figure 3.36. Locations of Istanbul Earthquake EU Stations (Alçık, 2011).

3.5. Role of Disaster Education in Japan and Turkey

When the disaster management plans of the two countries are examined, it is seen that pre-disaster, disaster situation and post-disaster planning are important for both countries for measures taken against disasters. Plans for pre-disaster risk reduction and for disaster response are very important when it comes to disaster management in order to reduce damages. However, it is of great importance in terms of improvement in post-disaster planning. Because the studies carried out after the disaster are also very important within the scope of returning to normal.

As seen in the section on the role of architects in disaster and disaster management in the literature review, architects have important responsibilities in the face of disasters. They have a big role to play before and after the disaster. Architecture is the first profession that comes to mind especially in terms of rapid recovery and the formation of temporary settlements after disasters. In this sense, architects are expected to take a more active role in disaster and disaster management. However, they also have important responsibilities in reducing disaster damages, that is, the work done before the disaster and the creation of sustainable and disaster-resistant structures after the disaster.

In this study, in which Turkey and Japan are compared (Figure 3.37), when we look at the disaster, design against disaster and disaster management education in Japan's architecture schools; Japan has extensive experience in disaster management as it has experienced many types of catastrophic natural disasters over the centuries, as examined in the study. Therefore, the architectural education system and course contents in Japan reflect their background in this field. An undergraduate student of architecture acquires sufficient knowledge and knowledge about disaster management in design studios and other courses. Most of the compulsory and elective courses include topics related to disaster and disaster management. It includes the first qualification exam and other exams after graduation, disaster reduction and management. Due to the special conditions of Japan, architects need to have detailed knowledge about tsunami, hurricane, flood and especially earthquake resistant design (Özdoğan & Güney, 2016).

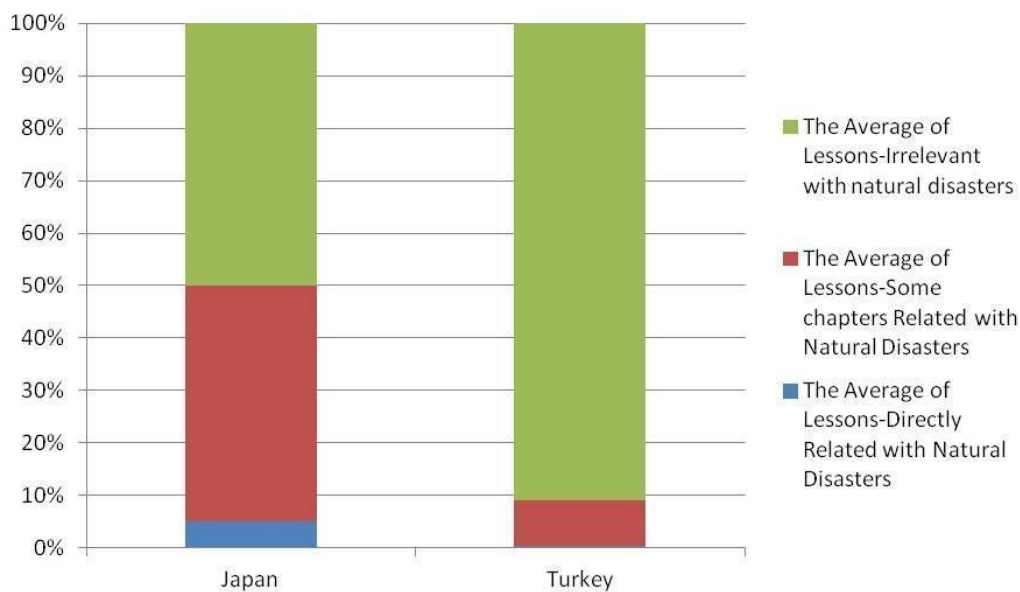


Figure 3.37. Comparison chart of Japan and Turkey's architecture schools' curriculum content (Özdoğan & Güney, 2016).

On the other hand, looking at the architecture schools of Turkey; The number of courses directly related to disaster and disaster management (including also earthquake resistant building design) according to the courses offered at the university level and their content is quite low. In addition, the number of courses partially (some parts of the content) on disaster and disaster management is again quite limited (Özdoğan & Güney, 2016).

4. EVALUATIONS

When the devastating earthquakes in Japan and Turkey are examined, it is seen that both countries regularly encounter earthquakes and its destructive effects. As encountered in the earthquakes examined, many people in both countries lost their lives, many were injured, and many buildings collapsed or seriously damaged in these earthquakes that occurred in regular periods. Generally, earthquakes in Japan differ in magnitude from Turkey. In addition, the fact that Japan is an island country in the ocean also causes tsunami danger with earthquakes. Especially when the earthquake in 2011 was examined, it was seen that in addition to the earthquake, the tsunami had devastating effects. On the other hand, although Turkey is a peninsula country, that is, surrounded by seas on three sides, it is difficult to say that the danger of tsunami is as effective as it is in Japan. However, the fact that it is located on a fault line that covers almost the entire country puts Turkey in danger on the whole country in terms of encountering earthquakes, as in Japan.

In terms of measures taken against earthquakes, Japan started developing these measures before Turkey. Since the establishment of the Seismic Society in 1880, Japan has begun to take steps in terms of taking measures against earthquakes. However, studies in terms of earthquake prevention in Turkey started from the 1940s.

In terms of earthquake regulation, in Japan, the regulation system started in 1919, was changed many times afterwards, and in 1981, a two-stage earthquake regulation was prepared, which is still valid today, and the system was largely changed for the last time and later revisions have been added to this regulation after major earthquakes. In Turkey, the earthquake regulation started again in the 1940s, but a holistic regulation understanding that still maintains its validity became possible after the 1999 Marmara Earthquake. In the regulations developed during this process, a stereotyped regulation system understanding could not be established. After the 1999 earthquake, which was a turning point, Turkey's perspective on earthquakes and disasters in general has changed.

The concept of disaster management started at similar times in both countries. In the 1940s and 1950s, the understanding of disaster management was developed in Japan and in 1961, the "Basic Law on Disaster Measures", which is still valid today in basic terms, entered into

force. This law, which has an understanding of an integrated disaster plan and action since its first form, has been strengthened together with countermeasure plans in order to take measures against disasters and reduce disaster damages after the major earthquakes and disasters experienced in 1995 and 2011. In addition, the transformation of the disaster management approach in the world from an understanding that attaches importance to disaster response and post-disaster recovery to an understanding that attaches great importance to disaster mitigation policies has paved the way for this change.

Especially after 2000, important developments have been experienced in terms of disaster management policy in Japan. Earthquakes that may occur in Japan were categorized (such as Tonankai / Nankai or Tokyo Inland Earthquakes) and predictions of possible losses and damages were made based on characteristics such as earthquake focal points, models, intensities. As a result, efforts have been made to reduce the damages of these earthquakes. In line with these studies, structural and non-structural strengthening works have been started. In addition, planning such as improvement of evacuation areas, raising awareness of education, coordination of volunteers is also included in these studies.

On the other hand, in Turkey, the disaster management regulations developed from 1944 to 1959 were mostly aimed at rehabilitating and reducing the damages to the region where the disaster occurred after the disasters that occurred. The disaster management plan, which came into force in 1959, was the first disaster management plan to come into force nationally. However, this law mainly focuses on post-disaster studies and shows a more “reactive” character until 2009. Since 2009, with the establishment of AFAD, the basic understanding of the new institution, which was established with the aim of carrying out disaster services from a single source, is to ensure that the pre, during and after disaster services, duties and responsibilities gathered at the center until 2009 are undertaken by local governments and to supervise and coordinate the relevant processes. In short, the central understanding in disaster management has been rearranged since 2009 and responsibilities have been shared by shifting it to local governments.

However, when all studies are examined, it has been evaluated that AFAD's point of view has not yet completely abandoned the more traditional disaster management approach and that a disaster management approach is dominant in both organizational structuring and post-disaster studies. In addition, the need to coordinate and develop both the institutional

structuring and the administrative and legal structuring (laws and regulations) to ensure an effective disaster risk management still continues. There are confusions and uncertainties in terms of ensuring adequate coordination with relevant institutions and organizations in technical, administrative and legal terms, as it is a new establishment compared to its peers.

On the other hand, TAMP, which entered into force in 2014, is the newest Disaster Response Plan that Turkey has developed in a modern and holistic sense. And it is hopeful that this plan touches on pre-disaster, disaster response and post-disaster issues. However, as mentioned earlier, pre- and post-disaster rehabilitation issues, although mentioned in the plan, have deficiencies and they need to be planned in more detail. In this sense, when compared with the prospective plans developed by Japan against possible earthquakes and disasters, it is seen that there are deficiencies and need to be improved.

One of the issues that should be evaluated within the pre-disaster context between the two countries is the concept of early warning system (EEW), which is included in the pre-disaster topic. Because there is an EEW system valid for the whole country in Japan, while Turkey has an EEW system located only in Istanbul. Besides, Japan has developed a more effective warning system network by separating this system as the public and private organization users in terms of informing the users. However, there is no such developed application network in Turkey.

In the concept of disaster awareness, it is seen that awareness-raising activities such as disaster management day or week are held in Japan. Particular attention has been paid to these issues and awareness has been increased since voluntary activists and non-governmental organizations played an active role in the 1995 Great Hanshin Earthquake. On the other hand, it has been observed that a series of awareness raising activities have been initiated in Turkey since 2013 within the scope of the "Disaster Prepared Turkey" campaign. On the other hand, the importance of education that can be included in the awareness-raising part is mentioned in the architect and architecture handling as one of the main actors of disaster management. In this sense, it has been observed that the proportion of courses such as disaster, disaster management and disaster preparedness given in architecture schools in Japan is higher than the courses such as disaster, disaster management and disaster preparedness given in architecture schools in Turkey.

Table 4.1. Comparison of Architectural Consciousness of Japan and Turkey in Earthquake Resistant

Disaster Approaches	Japan	Tukey
Seismic History	Regularly certain periods are to face earthquakes since antiquity. Compared to Turkey, earthquakes with larger magnitudes but shallower earthquakes are observed. The last devastating earthquake was in 2010.	Earthquakes occur at regular intervals. In terms of earthquake type, lower magnitude but deeper earthquakes are observed compared to Japan. The last devastating earthquake occurred in 2021.
Building Codes	<p>-Japan started developing these measures since the establishment of the Seismic Society in 1880. Japan has begun to take steps in terms of taking measures against earthquakes.</p> <p>- The building code system started in 1919. It was changed after each earthquake. In 1981, a two-stage earthquake regulation was prepared. And it is still active today. Later revisions have been added to this regulation after major earthquakes.</p>	<p>-Studies in terms of earthquake prevention in Turkey started from the 1940s.</p> <p>-The earthquake regulation started in the 1940s. However, understanding of a holistic regulation could not be developed.</p> <p>-After the 1999 Marmara Earthquake Turkey's perspective on earthquakes and disasters in general has changed.</p> <p>- The last change, which is still valid today, was made in 2018.</p>
Disaster Management	<p>In the 1940s and 1950s, the disaster management system was developed.</p> <p>-In 1961, the "Basic Law on Disaster Measures" entered</p>	<p>In Turkey, the disaster management plan, which came into force in 1959, was the first disaster management plan to come</p> <p>.</p>

Table 4.1. (Continue) Comparison of Architectural Consciousness of Japan and Turkey in Earthquake Resistant

Disaster Management	<p>into force. This law still protects the basic form of it. -And it has been strengthened together with countermeasure plans against disasters.</p> <p>-After 2000, earthquakes that may occur in Japan were categorized (such as Tonankai / Nankai or Tokyo Inland Earthquakes) and predictions of possible losses and damages were made.</p>	<p>into force nationally. However, this law mainly focuses on post-disaster studies 2009.</p> <p>-Since 2009, after AFAD, the central understanding in disaster management has been rearrange.</p> <p>- TAMP, which entered into force in 2014, is the newest Disaster Response Plan that Turkey has developed in a modern and holistic sense. However, pre and post-disaster rehabilitation issues exist in the plan.</p>
Early Warning System	EEW system valid for the whole country in Japan.	Turkey has an EEW system located only in Marmara Region.
Disaster Awareness	<p>-Disaster awareness-raising activities such as disaster management day or week are held in Japan.</p> <p>- The proportion of courses related to disaster given in architecture schools in Japan is higher than Turkey.</p>	<p>-Disaster awareness raising activities have been organizing in Turkey since 2013 within the scope of the "Disaster Prepared Turkey" campaign.</p> <p>- The proportion of courses related to disaster given in architecture schools in Turkey is lower than Japan.</p>

5. RESULTS AND FUTURE REMARKS OF THE STUDY

Disasters are natural, technological or human-based events that cause physical, economic and social losses for people and societies, and negatively affect them by stopping or interrupting normal life and human activities. The consequences of disasters, on the other hand, have great sociological and economic effects on societies, as well as physical and psychological effects on people, as examined in the study. These effects can cause traumatic results that cannot be overcome for years in societies and individuals, and they can also negatively affect the progress of societies.

Ethics as a discipline specifies moral duties and responsibilities in determining what is good and bad. Ethics has been an important part of philosophy and science as a subject that concerns moral behavior, actions and judgments. The sum of ethical principles and standards that guide and guide behavior in business life is called professional ethics. Professional ethics, on the other hand, is a set of professional principles aimed at to limits the personal tendencies of a certain professional group that orders members of the profession, compels them to behave with certain rules, excludes incompetent and unprincipled members from the profession, determines the responsibilities of professional members to each other, employers and employees, and especially to society, regulates professional competition, and protects service ideals.

The relationship between professional ethics and disasters can be easily reconciled by considering the effects of disasters experienced by society and individuals after a disaster. Professional groups such as architecture, whose human-structure-space-environment-society relationship is highly interconnected, have great responsibilities and rights in the reduction of pre-disaster damages and in the recovery process after disasters. From this perspective, it is understood that in the codes of professional ethics published by the architectural organizations of the countries, there should be direct or indirect articles, notes and parts related to disasters and their damages, taking into account that professional ethics regulates and determines the responsibilities of professional groups towards the society.

However, in the study, one direct and four indirect words related to disasters were selected and it was tried to determine whether or how they are included in the architectural ethical codes of the countries. And in the results obtained, the word disaster was found directly in

the ethical code published by the architectural organization of only 3 countries and was used only in Japan to mean "disaster resistant structures". Other indirect words, as detailed in the study, are not found in most of the ethical codes examined.

Nevertheless, as mentioned above, the most basic article that should be in the responsibilities towards society in the ethical code of a profession related to the concepts of human-structure-space-society, such as the profession of architecture, which is one of the oldest professions in history, should be related to disasters and the reduction of their damages. And the architectural organizations of countries that have a history of disasters and encounter some disasters more frequently should be more concerned about this issue. And in terms of ensuring the sustainability of the society, which is the biggest responsibility towards the society, this should be made a necessity rather than a recommendation or suggestion.

As a result of the findings in the study, the reflexes, that is, the approaches developed by Japan, where the word disaster is mentioned and which has a common disaster history with Turkey, were compared in order to better understand the importance of professional ethics. Both countries have always encountered and will continue to encounter earthquakes, which are one of the first events that come to mind when disasters are mentioned due to their locations. And therefore, as examined, they have developed measures against this earthquake and other major disasters.

One of these measures is the concept of disaster management developed for disasters. Although disaster management began to be developed in Turkey at similar times to Japan, a holistic disaster management concept and disaster management plan are considered quite new when compared to Japan. Although the establishment of AFAD in 2009 and TAMP developed in 2013 are considered new, seeing the start of such developments is quite promising in terms of the development of the concept of disaster management in Turkey. However, when these developments are analyzed in terms of their counterparts in Japan, major shortcomings are observed in terms of pre-disaster and post-disaster rehabilitation. Therefore, in Turkey, in addition to the development of TAMP, important studies should be carried out on pre-disaster and post-disaster rehabilitation concepts and effective plans should be developed on them.

In addition to the disaster management plan of Japan, there are countermeasure plans for different regions where it predicts future earthquakes, losses and what needs to be done. However, there is no such study in Turkey, except for the anticipated major Istanbul earthquake studies. In this context, it should not be forgotten that almost all of Turkey is on active fault lines, and according to the earthquake map it has, different countermeasure plans should be prepared for different regions, where future earthquakes, losses and what needs to be done are calculated.

On the other hand, compared to the EEW Systems owned by Japan, Turkey only has an EEW System covering Istanbul. Again, keeping in mind that almost all of Turkey lives with the reality of earthquakes, the number of these early warning systems should be increased and their usage and user profiles should be diversified.

In terms of earthquake awareness, it can be said that the studies and developments since 2013 are promising. However, when compared to the importance Japan attaches to the concept of disaster and earthquake awareness, it is seen that some corrections and forward-looking studies are needed. In order to spread awareness of disaster and earthquake, special studies should be carried out for children and the young generation starting from primary education. In addition, awareness raising activities should be carried out in terms of adults and parents in order to give this awareness to children.

As for the disaster and earthquake management of architecture, compared to Japan, Turkey has important work to do. When the ratios of the aforementioned courses given in the architecture schools of Japan and Turkey are examined, it is seen that Turkey is quite behind. Therefore, professional architects should be reminded that the architectural profession in Turkey is inextricably linked with the concepts of disaster, earthquake and disaster management, and efforts should be made to develop this awareness and sanctions should be applied. However, in order for this awareness to be given in the early period, that is, in the undergraduate period, the content and number of the courses related to the concepts of disaster, earthquake and disaster management should be enriched, and this awareness should be supported with presentations, seminars, conferences and workshops.

As a result, in this study, the differences between Japan and Turkey were examined over the precautions taken in the great earthquakes and disaster management policies. The

importance of disaster management and measures against earthquakes has been investigated. Without ignoring the importance of the development of seismic technology, the importance of a well-prepared disaster plan and management, pre-disaster and post-disaster rehabilitation plans, architecture and the role of raising the society's disaster awareness in reducing disaster risks was seen in the example of Japan, which was examined.

On the other hand, it has been determined that Turkey has some deficiencies compared to Japan. The developments that Turkey has experienced from earthquakes and disaster management policies, especially since 2009, are promising. However, when compared to Japan, the necessity of acceleration and development of these studies is seen in the examples of earthquakes and losses that occurred in two different locations in the same year in 2020. As a result of the study, it is hypothesized that countries that include disaster-related articles in their professional ethics codes published by architectural organizations approach disasters with a more holistic approach and take the concept of disaster relief more seriously. It has been examined and verified specifically for the country Japan.

And as mentioned, Japan, which draws attention and sets an example in terms of disaster, especially earthquake, sees the concept of disaster as an ethical value in the field of architecture as the responsibility of professionals who do the profession of architecture. In this sense, the concept of disaster should be included in the professional ethical codes of all countries (especially countries such as Turkey, which is more frequently exposed to disasters) and reflecting their ethical values to professional groups such as architecture, which have a high level of structure-natural environment-building-society relationship, reminding these responsibilities.

This study, which examines the relationship between architectural ethical codes and disaster in Japan and Turkey, which is constantly faced with earthquake disasters, is a basis for later studies for the literature. For the next stages, countries that face different disasters, architectural education systems, disaster management, disaster histories can be examined and this subject, which is missing in the literature, can be analyzed in more depth.

REFERENCES

- Airaksinen, T. (2012). *Professional ethics*. Encyclopedia of Applied Ethics. 616-623.
- Alçık, H. (2011). Deprem Erken Uyarı Sistemleri, Jeofizik Bülteni, *Van Depremi ve Deprem Özel Sayısı*, 22, 50-66.
- Ambraseys, N. N., & Zátópek, A. (1968). The Varto Üstükran (Anatolia) earthquake of 19 August 1966 summary of a field report. *Bulletin of the Seismological Society of America*, 58(1), 47-102.
- American Institute of Architects (AIA). (2020). *Codes of Ethics & Professional Conduct*. USA. Available at: https://content.aia.org/sites/default/files/2020-12/2020_Code_of_Ethics.pdf (Accessed: 23 April 2022)
- Ando, S. (2012). Evaluation of the Policies for Seismic Retrofit of Buildings. *Journal of Civil Engineering and Architecture*, 6(4), 391.
- Architecture and Design Scotland (A&DS). (2013). *Code of Conduct for Members of Architecture and Design Scotland*. Scotland.
- Architectural Institute of Japan (AIJ), (n.d.). *Code of Ethics*. Japan. Available at: <https://www.aij.or.jp/eng/about/ethics.html> (Accessed: August 13, 2022)
- Architects' Association of New Brunswick (AANB). (2020). *General By law*. New Brunswick. Available at: https://www.aanb.org/uploads/bylaw/50/file/translations/99/AANB_General_By-Laws-E_Oct_7_2020.pdf (Accessed: September 21, 2022)
- Architects' Association of Prince Edward Island (AAPEI). (2020). *Code of Conduct*. Prince Edward Island. Available at: <https://aapei.com/wp-content/uploads/2015/01/AAPEI-CODE-OF-ETHICS.pdf> (Accessed: September 11, 2022)
- Architectural Practice Board of South Australia (APBSA). (2009). *The Architects' Code of Conduct*. ASouth Australia. Available at: <https://www.archboardsa.org.au/assets/Uploads/2012-10-13-Code-of-Conduct.pdf> (Accessed: June 23, 2022)
- Aydın, İ. (2016). *Akademik etik*. Ankara: Pegem-A Yayıncılık
- Bank, W. (2018). *Converting Disaster Experience into a Safer Built Environment: The Case of Japan*. World Bank.
- Bikçe, M., (2015). *Türkiye’de Hasara ve Can Kaybına Neden Olan Deprem Listesi (1900-2014)*. 3. Türkiye Deprem Mühendisliği ve Sismoloji Konferansı, Dokuz Eylül Üniversitesi, İzmir.
- Board of Architects, Professional Engineers and Quantity Surveyors (BAPEQS). (2018). *Professional Conduct and Ethics*.

- Bommer, J., Spence, R., Erdik, M., Tabuchi, S., Aydinoglu, N., Booth, E., Peterken, O. (2002). Development of an earthquake loss model for Turkish catastrophe insurance. *Journal of Seismology*, 6(3), 431-446.
- Bowen, G., A. (2009), "Document Analysis as a Qualitative Research Method", *Qualitative Research Journal*, 9(2), 27-40.
- Brady, A., G. (1980). *An investigation of the Miyagi-ken-oki, Japan, earthquake of June 12, 1978*. US Department of Commerce, National Bureau of Standards.
- Büyüköztürk, Ş., Çakmak, E., K., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2017). *Bilimsel araştırma yöntemleri*. Pegem Atıf İndeksi, 1-360.
- Cabinet Office, Government of Japan (2015) White paper on disaster management 2015. Available at: http://www.bousai.go.jp/kaigirep/hakusho/pdf/WP2015_DM_Full_Version.pdf (Accessed: August 11, 2022)
- Chamber Hungarian of Architects (MEK). (2020). Ethics and Disciplinary Regulations. Available at: https://mek.hu/media/files/2020/kuldotgyules/szeptember/0911_hatarozatok/EFSZ_2_0201001-sk.pdf (Accessed: August 14, 2022)
- Chamber of Architecture and Spatial Planning of Slovenia (ZAPS). (2018). *Code of Professional Ethics for Members of the Chamber of Architecture and Spatial Planning of Slovenia*. Slovenia.
- Chaudhary, M. T., Piracha, A. (2021). Natural Disasters-Origins, Impacts, Management. *Encyclopedia* 1(4), 1101-1131.
- Chung, R. (1996). *The January 17, 1995 Hyogoken-Nanbu (Kobe) earthquake: performance of structures, lifelines, and fire protection systems*. US Department of Commerce, Technology Administration, National Institute of Standard and Technology.
- Clancey, G. (2006). *Earthquake Nation: The Cultural Politics of Japanese Seismicity, 1868-1930*: University of California Press.
- Clancey, G. (2006). The Meiji Earthquake: Nature, Nation, and the Ambiguities of Catastrophe. *Modern Asian Studies*, 40(4), 909-951. Retrieved from: <http://www.jstor.org/stable/3876638> (Accessed: June 3, 2022)
- Cohen, L., Manion, L. (1994). *Research Methods in Education*, Routledge and Kegan Paul, London.
- Colegio Nacional De Arquitectos Del Ecuador (CAE). (2013). *Code of Ethics Professional of the Architects of Ecuador*. Ecuador. Available at: <https://colegioarquitectosecuador.files.wordpress.com/2013/08/cog-etica-profesional-20131.pdf> (Accessed: June 3, 2022)

- Conselho de Arquitetura e Urbanismo do Brasil (CAU/BR). (2013). *Code of Ethics and Discipline for Architects and Urban Planners*. Brasil. Available at: https://www.caubr.gov.br/wp-content/uploads/2015/08/Etica_CAUBR_06_2015_WEB.pdf (Accessed: May 3, 2022)
- Consiglio Nazionale degli Architetti, Pianificatori, Paesaggisti e Conservatori (CNAPPC). (2021). *Deontological Code*. Italy.
- Croatian Chamber of Architects (CCA). (2013). *National Guidelines for Quality and Culture of Building*. Croatia.
- Czech Chamber of Architects (CCE). (2020). *The General Assembly of the Czech Chamber of Architects*. Czech Republic.
- Dallı, M., Soyluk, A. (2022a). *Comparison of The Natural Disaster Management Policies in The Point of View of Architecture*. 11th International Farabi Conference on Social Sciences, Atatürk Üniversitesi, Erzurum. p:1008-1019
- Dallı, M., Soyluk, A. (2022b). Ethical analysis of architecture on structural irregularities in major earthquakes in Turkey. *International Journal of Disaster Resilience in the Built Environment*. ahead-of-print.
- DeSensi, J. T., Rosenberg, D. (1996). *Ethics in sport management*. Fitness Information Technology, Inc.
- EM-DAT, (2020) EM-DAT Database Advanced Search, Available at: <https://www.emdat.be/publications>, (Accessed: June 8, 2022).
- EM-DAT, (2021) EM-DAT Database Advanced Search, Available at: <https://www.emdat.be/publications>, (Accessed: June 8, 2022).
- Ekiz, D. (2015). *Bilimsel araştırma yöntemleri*. Anı Yayıncılık.
- Erdik, M., Fahjan, Y., Ozel, O., Alcik, H., Mert, A., & Gul, M. (2003). Istanbul earthquake rapid response and the early warning system. *Bulletin of Earthquake Engineering*, 1(1), 157-163.
- Erkal, T., Değerliyurt, M. (2009). Türkiye’de afet yönetimi. *Doğu Coğrafya Dergisi*, 14(22), 147-164.
- Eryılmaz, M., Dizer, U. (2007). *Afet Tıbbı* (2. Baskı). Ankara: Ünsal.
- Ferrell, O.C., Fraedrich, J. (1994), *Business Ethics: Ethical Decision Making and Cases*, Houghton Mifflin Company, Boston.
- Fujinawa, Y., Noda, Y. (2013). Japan's Earthquake Early Warning System on 11 March 2011: Performance, Shortcomings, and Changes. *Earthquake Spectra*, 29(1), 341-368.

- Ganapati, N. E. (2008). *Disaster management structure in Turkey: away from a reactive and paternalistic approach?*. Disaster Management Handbook, CRC Press, Boca Raton, FL.
- Gökçe, O., Tetik, Ç. (2012). *Teoride ve pratikte afet sonrası iyileştirme çalışmaları*. AFAD yayınları, 270ss.
- Greer, A. (2012). Earthquake preparedness and response: Comparison of the United States and Japan. *Leadership and Management in Engineering*, 12(3), 111-125.
- Güler, Ç., Çobanoğlu, Z. (1994). *Afetler*. Çevre Sağlığı Temel Kaynak Dizisi No. 33, TC Sağlık Bakanlığı Sağlık Projesi Genel Koordinatörlüğü, Ankara.
- Gülkan, P. (2000). Building code enforcement prospects: The failure of public policy. *Earthquake Spectra*, 16(1), 351-374.
- Haçin, İ. (2014). 1939 Erzincan Büyük Depremi. *Atatürk Araştırma Merkezi Dergisi*, 30(88), 37-70.
- Hiroshi, K. (2006). Seismic Design Codes for Buildings in Japan. *Journal of Disaster Research*, 1(3), 341-356.
- Holzer, T. L. (1995). The 1995 Hanshin-Awaji (Kobe), Japan, earthquake. *GSA TODAY*, 5(8).
- Hoshiba, M., Kamigaichi, O., Saito, M., Tsukada, S. Y., Hamada, N. (2008). Earthquake Early Warning Starts Nationwide in Japan. *Eos, Transactions American Geophysical Union*, 89(8), 73-74.
- Ikeda, M. (2012). *Disaster management plans*. The World Bank.
- Ikegaya, M. (2013). *Geographic study of historic preservation: evolving cultural landscape and development of modern Japan*: The University of North Carolina at Greensboro.
- Ilki, A., Celep, Z. (2012). Earthquakes, existing buildings and seismic design codes in Turkey. *Arabian Journal for Science and Engineering*, 37(2), 365-380.
- Indonesian Institute of Architects (IAI). (2017). New Law on Architect. Available at: <https://indonesiarealestatelaw.com/law-number-6-of-2017-on-architect/> (Accessed: July14, 2022)
- Internet: United States Geological Survey (USGS). (2014). Understanding Plate Motions. URL: <https://pubs.usgs.gov/gip/dynamic/fire.html> (Accessed: August 13, 2022)
- Internet: Disaster and Emergency Management Authority (AFAD). (2018). Earthquake Hazard Map of Turkey. URL: <https://depem.afad.gov.tr/images/depbolge/depem-tehlike.jpg> (Accessed: August 1, 2022)
- Internet: Wikipedia. Metropolitan Police Office burning after the 1923 Great Kanto Earthquake. URL:

https://en.wikipedia.org/wiki/1923_Great_Kant%C5%8D_earthquake#/media/File:Metropolitan_Police_Office_after_Kanto_Earthquake.jpg (Accessed: May 3, 2022)

Internet: Wikipedia. Daiwa Department Store After the Fukui Earthquake. URL: https://en.wikipedia.org/wiki/1948_Fukui_earthquake#/media/File:Fukui_Earthquake_1948_-_damaged_building.jpg

Internet: Wikipedia. Daiwa Department Store After the Fukui Earthquake. URL : https://en.wikipedia.org/wiki/1948_Fukui_earthquake#/media/File:Daiwa_Department_Store_after_Fukui_Earthquake.JPG (Accessed: May 3, 2022)

Internet: Japan Science and Technology Agency (JST). (2017). Next Generation Damage Evaluation and Seismic Design Based on Collapse Mechanism and Residual Capacity of Buildings Damaged Due To Repeated Strong Ground Motions. URL: <https://www.jst.go.jp/inter/sicp/country/j-rapid/kumamoto/pdf/kadai02.pdf> (Accessed: April 21, 2022)

Internet: Taylor, A. (2011). 5 Years Since the 2011 Great East Japan Earthquake. URL: <https://www.theatlantic.com/photo/2016/03/5-years-since-the-2011-great-east-japan-earthquake/473211/> (Accessed: May 3, 2022)

Internet: Pletcher, K. (2011). Wreckage from Japan Earthquake and Tsunami of 2011. URL 8: <https://www.britannica.com/event/Japan-earthquake-and-tsunami-of-2011> (Accessed: April 4, 2022)

Internet: Bilgipedia. 1944 Bolu-Gerede Depremi. URL: <https://www.bilgipedia.com.tr/wp-content/uploads/2020/01/1944-Bolu-Gerede-depremi.jpg> (Accessed: April 21, 2022)

Internet: Japan Meteorological Agency (JMA). (2006). Earthquake Early Warning: How can an earthquake alert be announced before tremors are felt? URL: <https://www.jma.go.jp/jma/en/Activities/how.pdf> (Accessed: August 22, 2022)

Ishibashi, K. (2004). Status of historical seismology in Japan. *Annals of Geophysics*, 47(2-3).

Ishiyama, Y. (2011). Introduction to Earthquake Engineering and Seismic codes in the world. *Hokkaido University, Hokkaido, Japan*, 21(53).

Jenson, E. (1997), "Disaster management ethics (training program)", available at: www.humanitarianinfo.org (Accessed: April 18, 2022)

Jimee, G. K., Meguro, K., Dixit, A. M. (2019). Learning from Japan for possible improvement in existing disaster risk management system of Nepal. *Open Journal of Earthquake Research*, 8(02), 85.

Jupp, V. (2006). *The SAGE Dictionary of Social Research Methods*. SAGE Publications Ltd. London.

Karasar, N. 2005. *Bilimsel Araştırma Yöntemleri (15. Baskı)*. Nobel Yayın, Ankara, 292

- Keskin, E., Bozdoğan, K. B. (2018). 2007 ve 2018 Deprem Yönetmeliklerinin Kırklareli İli Özelinde Değerlendirilmesi. *Kırklareli Üniversitesi Mühendislik ve Fen Bilimleri Dergisi*, 4(1), 74-90.
- Kuterdem, K. (2010). *A New Disaster Management Structure in Turkey*. Paper presented at the 1st Meeting of the European Forum for Disaster Risk Reduction (EFDRR).
- Leider JP, DeBruin D, Reynolds N, Koch A, Seaberg J. (2017). Ethical Guidance for Disaster Response, Specifically Around Crisis Standards of Care: A Systematic Review. *Am J Public Health*. 2017 Sep;107(9):e1-e9. doi: 10.2105/AJPH.2017.303882. Epub 2017 Jul 20. PMID: 28727521; PMCID: PMC5551597.
- Lloyd-Jones, T., Kalra, R. (2010). *The built environment professions in disaster risk reduction and response*. RICS, ICE, RIBA, RTPI. In: MLC Press, Max Lock Centre, University of Westminster.
- Matsu'ura, R. S. (2017). A short history of Japanese historical seismology: past and the present. *Geoscience Letters*, 4(1), 1-15.
- McHugh, F. P. (1992). *İş ahlakı*. TÜSİAD Yay. İstanbul.
- Mermer, G., Donmez, R. O., Daghan, S. (2018). The evaluation of the education for earthquake preparation addressed to middle school students. *JPM. The Journal of the Pakistan Medical Association*, 68(12), 1809-1815.
- Milne, J. (1894). *The great earthquake in Japan, 1891. / By John Milne and W. K. Burton; plates by K. Ogawa*. Yokohama, Japan: Lane, Crawford & Co.
- Mimura, N., Yasuhara, K., Kawagoe, S., Yokoki, H., & Kazama, S. (2011). Damage from the Great East Japan Earthquake and Tsunami-a quick report. *Mitigation and adaptation strategies for global change*, 16(7), 803-818.
- Mitchell, W. A. (1976). *The Lice Earthquake in Southeastern Turkey: A Geography of the Disaster*. US. Air Force Academy, Colorado.
- Muguruma, H., Nishiyama, M., Watanabe, F. (1995). Lessons learned from the Kobe earthquake—A Japanese perspective. *PCI journal*, 40(4), 28-42.
- New Zealand Registered Architects Board (NZRAB). (2018). *Ethical Code For Registered Architects*, New Zealand. Available at: https://www.nzrab.nz/Editable/Assets/Misc/New_Zealand_Architects_Code_of_Ethics_from_1_January_2018.pdf (Accessed: September 21, 2022)
- Nigerian Institute of Architects (NIA). (2009). *Nigerian Institute of Architects Code of Professional Conduct and Ethics*. Nigeria.
- Norio, O., Ye, T., Kajitani, Y., Shi, P., Tatano, H. (2011). The 2011 eastern Japan great earthquake disaster: Overview and comments. *International Journal of Disaster Risk Science*, 2(1), 34-42.

- OECD. (2009). *OECD Reviews of Risk Management Policies: Japan 2009*.
- Okimura, T., Takada, S., Koid, T. H. (1996). Outline of the great Hanshin earthquake, Japan 1995. *Natural Hazards*, 14(1), 39-71.
- Ordre des architectes du Québec (OAQ). (2021). Code of ethics of architects. Available at: <https://www.legisquebec.gouv.qc.ca/en/pdf/cr/A-21,%20R.%205.1.pdf> (Accessed: July14, 2022)
- Order of Architects and Consulting Engineers (OAI). (2018). Dossier législation et réglementation de l'Ordre des Architectes et des Ingénieurs-Conseils. Available at: <https://www.oai.lu/files/Publications/Legislation/legisoai6.pdf> (Accessed: April 21, 2022)
- Otani, S. (2000). *Japanese development of earthquake resistant building design*. Paper presented at the Proceedings of International Symposium of Earthquake Engineering.
- Otani, S. (2008). *The dawn of structural earthquake engineering in Japan*. Paper presented at the the 14th world conference on earthquake engineering. Beijing, China.
- Özbek, Ö. (2011). *Afet yönetiminin etkin müdahale yönünden bayes ağları ile modellenmesi ve değerlendirilmesi*. Yüksek lisans tezi. Erciyes Üniversitesi, Fen Bilimleri Enstitüsü, Kayseri.
- Özçelik, F. (2017). 1944 Bolu-Gerede Depremi. *Akademik İncelemeler Dergisi*, 12(2), 91-113.
- Özden, A. T. (2007). Constituting a sustainable community after disasters: the role of architect. *Journal of Faculty of Built Environment*, 9(3), 1-17.
- Özdoğan, F., Güney, D. (2016). The importance of architecture education for disaster mitigation. *WIT Transactions on Ecology and the Environment*, 204, 373-384.
- Özmen, B. (2000). 17 Ağustos 1999 İzmit Körfezi Depremi'nin Hasar Durumu (Rakamsal Verilerle) *Türkiye Deprem Vakfı, TDV / DR 010-53*
- Özmen, B., Özden, T. (2013). Türkiye'nin afet yönetim sistemine ilişkin eleştirel bir değerlendirme. *İstanbul Üniversitesi Siyasal Bilgiler Fakültesi Dergisi* (49).
- Philippines Professional Regulation Commission (PRC). (2006). *The Professional Regulatory Board of Architecture*. Philippines.
- Prieur, M. (2011), *European and Mediterranean Major Hazards Agreement (EUROPA)*, Strasbourg; Council of Europe.
- Pritchard, J. (1998). *Code of Ethics*. Encyclopedia of Applied Ethics. California: Academic Press.
- Ranghieri, F., Ishiwatari, M. (2014). *Learning from megadisasters: lessons from the Great East Japan Earthquake*. The World Bank.

- Reitherman, R. (2008). International aspects of the history of earthquake engineering. *Earthquake Engineering Research Institute*.
- Royal Institute of British Architects (RIBA). (2019). *Code of Professional Conduct: For members of the Royal Institute of British Architects*. United Kingdom. Available at: <https://www.architecture.com/knowledge-and-resources/resources-landing-page/code-of-professional-conduct> (Accessed: 8 May 2022)
- Royal Architectural Institute of Canada (RAIC). (2020). *Professional Conduct and Ethics*. Canada. Available at: <https://chop.raic.ca/chapter-1.3> (Accessed: May 3, 2022)
- Saito, T. (2007). *Disaster management of local government in Japan*. Paper presented at the National Workshop, organized by UNCRD and Japan-Peru Center for Seismic Research and Disaster Mitigation (CISMID)/Peru National University of Engineering (UNI).
- Saya, S. (2017). *Cabinet Office, Government of Japan (CAO)—Japan's International Cooperation on DRR: Mainstreaming DRR in International Societies*. Paper presented at the Workshop on World Landslide Forum.
- Schuklenk, U. (2020). COVID19: Why justice and transparency in hospital triage policies are paramount. *Bioethics* 34(4): 325–327.
- South African Council for The Architectural Profession (SACAP). (2021). Code Of Conduct for Registered Persons. Available at: <https://www.sacapsa.com/documents/uploads/WGxnWxu4FdvIwr6S-0.pdf> (Accessed: 21 September 2022)
- Soyluk, A., & Harmankaya, Z. Y. (2012). The history of development in Turkish seismic design codes. *International Journal of Civil & Environmental Engineering*, 12(1), 25-29.
- Spencer, E. (1997). *Professional Ethics*. J.C. Fletcher. Maryland: University Publishing Group, Inc.
- Stead, W., Worrell, D., & Stead, Jean. (1990). An Integrative Model for Understanding and Managing Ethical Behavior in Business Organizations. *Journal of Business Ethics*. 9. 233-242.
- Stone, J.R. (2007). Importance of community input: a moral framework for disaster planning. *Practical Bioethics*, 2(4), 9-11
- Superior Council of the Colleges of Architects of Spain (CSCAE). (2021). Available at: <https://www.cscae.com/index.php/servicios58/quiosco-cscae/37-conoce-cscae/area-uridica/3705-codigo-deontologico-de-los-arquitectos> (Accessed: March 14, 2022)
- Şahin, A. U. (2020). Afet Yönetimi ve Planlaması Perspektifinden Türkiye Afet Müdahale Planının Değerlendirilmesi. *Resilience*, 4(1), 129-158.

- Takeuchi, F. (1989). Recurrence of the Large Earthquakes associated with the Fukui Earthquake Fault, as Derived from Subsurface Structure, Topography and the Present Day Seismic Activity. *Bulletin of the Disaster Prevention Research Institute.*, 39(4), 91-127.
- Teshigawara, M. (2012). Outline of earthquake provisions in the Japanese building codes. *Preliminary reconnaissance report of the 2011 Tohoku-Chiho Taiheiyo-Oki Earthquake. Geotechnical, geological and earthquake engineering*, 23, 421-446.
- The Royal Australian Institute of Architects (RAIA). (2017). *Code of Professional Conduct*. Australia. Available at: <https://www.architecture.com.au/wp-content/uploads/Institute-Code-of-Professional-Conduct.pdf> (Accessed: 21 September 2022)
- Turkey Disaster Response Plan (TAMP). (2013). Retrieved on May 17, 2021 from Disaster and Emergency Management Presidency: https://www.afad.gov.tr/kurumlar/afad.gov.tr/2419/files/Afet_Mud_Pl_ResmiG_20122013.pdf.
- Varol, N., & Kırıkkaya, E. B. (2017). Afetler karşısında toplum dirençliliği. *Resilience*, 1(1), 1-9.
- Wach, E. and Wolcott, S. (2013). *Learning about Champions – Individuals Catalysing Social Change*. IDS Practice Paper in Brief 12. Brighton: IDS
- Wagemann, E., & Ramage, M. (2013). Relief for the curriculum. *Architecture Education and disaster recovery. The Cambridge Architecture Journal*. 129-133.
- Whittaker, A., Moehle, J., & Higashino, M. (1998). Evolution of seismic building design practice in Japan. *The Structural Design of Tall Buildings*, 7(2), 93-111. doi:[https://doi.org/10.1002/\(SICI\)1099-1794\(199806\)7:2](https://doi.org/10.1002/(SICI)1099-1794(199806)7:2)
- William, M., Pomonis, A., Booth, E., & Ring, S. (1992). *The Erzincan Turkey Earthquake, of 13 March 1992: A field report by EEFIT*. London, UK: EEIFI.
- Yıldırım, A., & Şimşek, H. (2013). *Sosyal bilimlerde nitel araştırma yöntemleri*. Seçkin Yayıncılık.
- Yılmaz, A. (2003). *Türk kamu yönetiminin sorun alanlarından biri olarak afet yönetimi*: Pegem A Yayıncılık.
- United States Geological Survey (USGS). (2014). Pacific Ring of Fire. Retrieved: May 1, 2022, from: <https://pubs.usgs.gov/gip/dynamic/fire.html>
- Yoshimi, Y. (1970). *An outline of damage during the Tokachioki earthquake. Soils and foundations*, 10(2), 1-14.
- Zack, N. (2009). *Ethics for disaster*. Plymouth. United Kingdom; Rowman & Littlefield Publishers Inc.

Zaré, M., & Afrouz, S., G. (2012). Crisis management of Tohoku; Japan earthquake and tsunami, 11 March 2011. *Iranian journal of public health*, 41(6), 12.



Gazili olmak ayrıcalıktır