

EARTHQUAKE RISK MANAGEMENT IN SPATIAL PLANNING: THE CASE OF BAYRAKLI-İZMİR

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ABSTRACT

EARTHQUAKE RISK MANAGEMENT IN SPATIAL PLANNING: THE CASE OF BAYRAKLI-İZMİR

Turkey has a rapid urbanization and expansion, especially since 1950s. Today, 93.4 percent of the population live in urban areas (TurkSTAT 2022). This is a threat for the country because disasters that cause great damage to human life, building stock and urban infrastructure affect urban areas more negatively. Consequences of earthquake disasters have been experienced before because most of the country consists of earthquake-prone regions defined as high risk. That is why, the issue of reducing earthquake risks in spatial planning processes is of great importance for the country. Disaster mitigation strategies, policies, actions in planning decision making and implementation processes are currently crucial and cannot be postponed.

30 October 2020 earthquake caused more than 117 deaths, collapse of numerous buildings and massive damage in Bayraklı district of Izmir. The extent of the damage show that once again, the city has a high earthquake risk however it is not adequately prepared for that risk. This study aims to provide an overview of risk management in spatial planning, as well as providing guidance for future spatial planning methodologies, from the perspective of Izmir-Bayraklı's previous planning initiatives. After evaluating the earthquake risk management in spatial planning generally, the case of Bayraklı will be analysed in detail. This will include an analysis of the previous plans' risk management strategies, an explanation of why such significant destruction took place despite the existence of a nation-wide strict legal framework and planning efforts, and a recommendation for a spatial planning policy that will ensure the sound-basis risk management in planning. The case study area includes Mansuroğlu, Manavkuyu and Adalet neighbourhoods located in Bayraklı district of İzmir province.

Key Words: earthquake risk reduction, risk management in spatial planning, secure settlements, mitigation approach.

ÖZET

MEKANSAL PLANLAMADA DEPREM RİSKİ YÖNETİMİ: BAYRAKLI-İZMİR ÖRNEĞİ

Türkiye özellikle 1950'li yıllardan bu yana hızlı bir kentleşme ve genişleme yaşamaktadır. Bugün nüfusun yüzde 93,4'ü kentsel alanlarda yaşamaktadır (TÜİK 2022). İnsan hayatına, yapı stoğuna ve kentsel altyapıya büyük zararlar veren afetlerin kentsel bölgeleri daha olumsuz etkilemesinden dolayı, bu durum aslında ülke için bir tehdittir. Ülkenin büyük bölümünün yüksek riskli olarak tanımlanan deprem eğilimli bölgelerden oluşması nedeniyle, daha önce de deprem felaketinin sonuçları yaşanmıştır. Bu sebeple, mekânsal planlama süreçlerinde deprem risklerinin azaltılması konusu ülke için büyük önem taşımaktadır. Planlamanın karar alma ve uygulama süreçlerinde afet zararlarını azaltma stratejileri, politikaları, eylemleri hayati öneme sahiptir ve ertelenemez.

30 Ekim 2020 depremi, İzmir'in Bayraklı ilçesinde 117'den fazla kişinin ölümüne, çok sayıda binanın çökmesine ve büyük hasara neden oldu. Hasarın boyutu, şehrin deprem riskinin yüksek olduğunu ancak bu riske yeterince hazırlıklı olmadığını bir kez daha ortaya koymuştur. Bu çalışma, İzmir-Bayraklı'nın önceki planlama girişimleri perspektifinden, mekânsal planlamada risk yönetimine genel bir bakış sağlamanın yanı sıra gelecekteki mekânsal planlama metodolojileri için rehberlik sağlamayı amaçlamaktadır. Mekânsal planlamada deprem risk yönetimi genel olarak değerlendirildikten sonra Bayraklı örneği ayrıntılı olarak sunulacaktır. Bu değerlendirme, önceki planların risk yönetimi stratejilerinin bir analizini, ülke çapında katı bir yasal çerçevenin ve planlama çabalarının varlığına rağmen neden bu kadar önemli yıkımın gerçekleştiğinin bir açıklamasını ve planlamada risk yönetimini sağlam temellere oturtacak bir mekânsal planlama politikası önerisi içermektedir. Örnek çalışma alanı, İzmir İli Bayraklı İlçesi'nde bulunan Mansuroğlu, Manavkuyu ve Adalet Mahallelerini kapsamaktadır.

Anahtar Kelimeler: deprem riskinin azaltılması, mekânsal planlamada risk yönetimi, güvenli yerleşimler, sakinim yaklaşımı.

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CHAPTER 1

INTRODUCTION

Disasters are one of the priority issues for the city planning discipline. Especially earthquakes are significant in decision making and implementation processes because of posing high risk in city life. They threaten not just in respect to living life, but also can cause environmental, ecological, social, economic, and spatial damages and destructive results. Despite being exposed to earthquakes throughout history, today, the existence of especially high-density settlements and metropolises makes the negative consequences of these disasters more devastating. This situation necessitated the actors to take responsibility for disaster risk management. Thus, traditional disaster policies including post-disaster recovery and rehabilitation, was replaced by risk-oriented approaches. According to this approach, risks can be minimized only when disaster risk management strategies are developed and implemented as policies.

Disaster management requires a holistic approach, and it has a cyclical structure. Such a perspective encompasses resource control and coordination, analysis and synthesis, planning, decision making, implementation and evaluation across various risks (Türkoğlu et.al. 2009). It covers all the emergency phases. These are preparedness, mitigation, response, and recovery. The first phase, preparedness, entails establishing emergency authorities and responsibilities as well as organizing assistance resources. The second is the risk reduction (mitigation), which are the actions taken to mitigate or completely prevent the potential loss of life and loss of property and their long-term impacts. As a preventive measure, spatial planning is crucial for long-term risk reduction and mitigation. The third phase, response, occurs after a disaster has occurred and involves the rescue of people and property. And last one, recovery, addresses both short-

term and long-term initiatives to restore stability to the infrastructure, physical environment, and social environment, to normalize social and economic life. Earthquake risk management is a specialized subcategory of disaster risk management, with a focus on earthquakes.

This thesis argues that even though earthquake risk management requires multidisciplinary work, spatial planning is the backbone of this as a preventive measure. It tries to give spatial planning guide for earthquake risk reduction in cities. It is framed over a case study. And, in the most general sense, it is suggested inclusion of earthquake risk management policies in spatial planning both in decision-making and implementation processes, and control will provide earthquake resilience.

1.1. Definition of the Problem

Turkey is one of the earthquake-prone countries of the world. Despite this, there is still a great deal of loss of life and property due to earthquakes and earthquake triggered secondary disasters. The Marmara earthquake in 1999 caused great damage. During this thesis, on February 6, 2023, the country suffered the deadliest earthquake in its history. Ten cities and the surrounding rural areas, which are located along the length of the impact zone, were damaged in this Kahramanmaraş centred earthquake. Numerous fatalities (more than 50.000) resulted from the quakes' widespread building collapse and severe structural damage. In the national news, it highlighted that tens of thousands of people are believed to be buried beneath the debris, and the death toll is expected to be considerably higher than the official figure (BirGün 2022). The earthquakes once again exposed shoddy building practices, the effects of false urbanization, meager planning system, and ineffective administration. Understanding why Turkey has been exposed that much of disaster risk requires an in-depth analysis of Turkey's state-political relationship and a socio-economic analysis that goes beyond the scope of this study.

Earthquakes are evaluated generally with their geological or physical aspects. But they are not only physical events themselves. Vulnerability and exposure are components of earthquake risk and triggered disaster risks. Damages of the cities and citizens can be preventable with earthquake resistance. The earthquake hazard does not have to turn into an earthquake disaster. The earthquake cannot be prevented, but the negative, harmful,

destructive effects of the earthquake can be reduced or prevented. Therefore, it is necessary to discuss comprehensively spatial, political, economic, social, and environmental aspects of earthquake in Turkey, and develop new, creative, and effective solution proposals about earthquake risk management in planning.

1.2. Aim of the Study and Research Questions

Rather than traditional disaster policies, which includes insufficient legal rules, post-disaster policies, recovery, and rehabilitation processes, hypothesis of this study is that an integrated planning system, which shows a guideline for future risk-oriented, mitigation-priority actions, is effective in terms of earthquake-resistant cities. And it proposes a framework for this. Most damaged region in the earthquake dated October 30, 2020, was chosen as case study area. It is Mensurable, Manavkuyu and Adalet neighbourhoods of Bayraklı district. Main purpose is to evaluate the current policies, plans and statutory documents of these neighbourhoods in terms of earthquake risk management in spatial planning. According to problem definition and aim of the study several research questions are determined:

- What is the role of spatial planning in earthquake risk management?
- What are the practices, policies, laws, plans effective for providing earthquake resistant city (world examples)?
- What lessons can draw from the world's risk-oriented, mitigation-prioritized implementations for the spatial planning processes?
- What laws, rules and policies have been created in Turkey about disasters?
- How effective the existing planning's performance of Bayraklı to earthquake mitigation?
- What is the legal and institutional frame to which the exposed areas are subject? Should they continue, be changed, or be removed?
- What are the previous plans and disaster approaches of exposed area? Should they continue, be changed, or be removed?
- How can planning be more effective in terms of earthquake risk management in Turkey?

1.3. Methodology

This study, case in Adalet, Mansurođlu and Manavkuyu neighbourhoods of Bayraklı in Izmir's, offers suggestions about earthquake risk management in spatial planning processes. It tries to reveal the general understanding of the planning approach to earthquake risky areas with municipality interviews, regulations, and plans examination. It lays on risk-based and mitigation-priority planning perspective and promotes multi-disciplinary works and GIS-based analysis (with earthquake and triggered disasters scenarios and risk assessments).

The study fictionalized two majorly as theoretical frame and case study. And qualitative research methods were used in line with the research questions. Theoretical frame refers to literature review. Various sources in the literature were scanned, international incentives, reports, practices, policies were examined, the theoretical background of the perspective on disasters was examined historically, and the transition from traditional approaches to risk-oriented approaches was explained. In addition, the general practices of some developed countries, which are considered successful in the world in terms of earthquake risk management, were examined, and the situation in Turkey was examined in comparison, especially the legal and institutional framework was evaluated in terms of earthquake risk management in planning. This also reveals the development process of earthquake risk management in spatial planning.

In case study phase, general-to-specific approach was adopted. After researching the earthquake hazard in Turkey and Izmir, Izmir's earthquake history, development and planning history, earthquake risk management practices in spatial planning were presented. Discussions were held with the relevant municipalities (İzmir Metropolitan Municipality, Bornova Municipality and Bayraklı Municipality) in the research area, plans, reports, data, and documents were obtained, and all were evaluated in the thesis. At this stage, nine post-republic plans and their reports, two projects and three non-spatial plan reports for Izmir were examined. These plans are Danger and Prost Plan in 1925, Le Corbusier Plan in 1949, Aru, Özdeş and Canpolat Plan in 1955, Bodmer Plan in 1960, Metropolitan Planning Department Plan in 1973, Metropolitan Municipality Plan in 1989, İzmir Metropolitan Earthquake Master Plan (from RADIUS Project) in 1999, and İzmir Metropolitan Environmental Plan in 2012, Reserve Building Area Plan in 2020. These

projects are RADIUS project and İZKA project. These non-spatial plan reports are: Provincial Emergency Aid Plan, Provincial Disaster Risk Reduction Plan (IRAP) and Strategic Plan for the years 2020-2024. Then these plans, reports and projects were evaluated in terms of earthquake risk management for the selected case area. Finally, all the information obtained for the case area was examined by matching with the theoretical framework, especially the legal and institutional background presented.

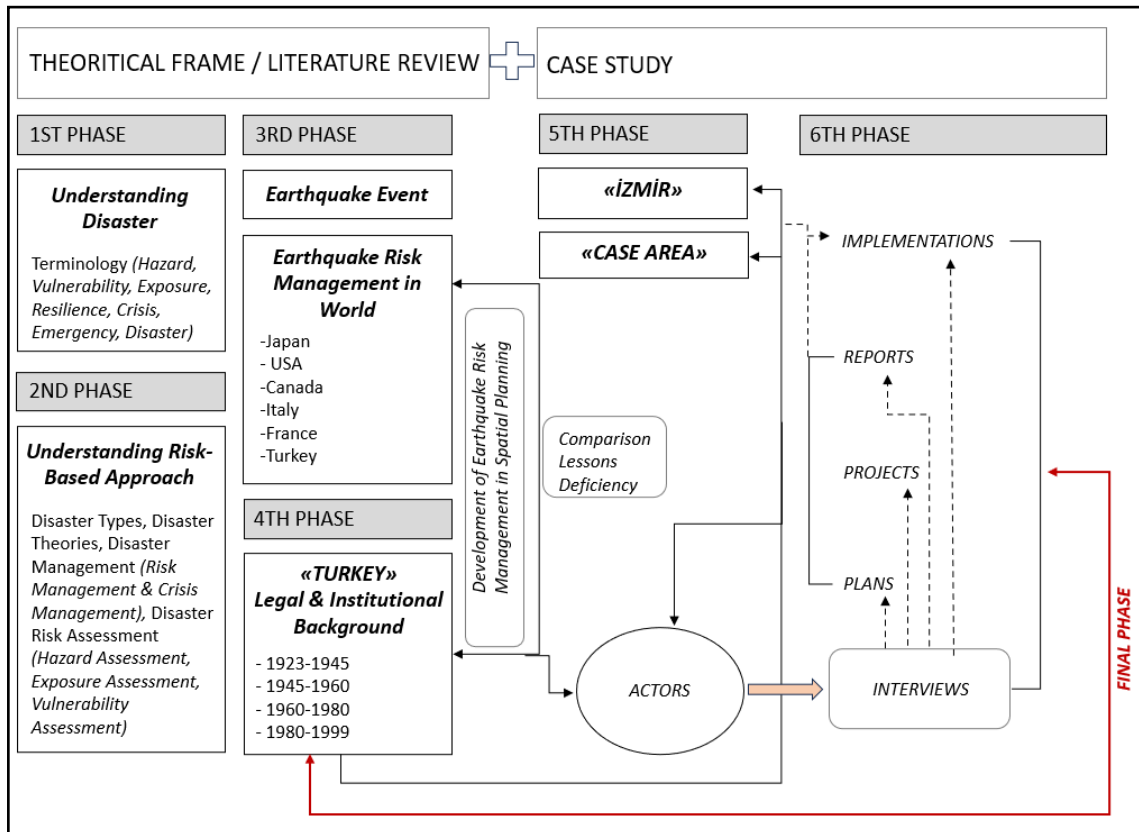


Figure 1. Methodology of the Study

1.4. Organisation of the Study

The study consists of seven main parts. While the first four main chapters mostly use the literature (academic studies, articles, reports, symposiums, laws, regulations etc.), the latter three chapters include the study area, analyses, and results. First part of the study, the introduction chapter, gives the definition of the problem, aim of the study, research questions, methodology and key terminology, to understand disaster risk. Key

terminology includes explanations of "hazard", "vulnerability", "exposure", "risk", "resilience", "crisis", "emergency" and "disaster" concepts. Clearly understanding of "earthquake hazard", "earthquake disaster" and "earthquake risk" is critical for this thesis. Differences and relations of these concepts light to the thesis. Hazards are situations and events that have the potential to harm the living and built environment, in other words, that can be described as a "threat". Disaster, on the other hand, is the result of a hazard in its most general sense. In other words, disasters cover negative and destructive effects on living beings and built environment. Hazards that occur in a deserted area and do not affect the community are not called disasters (Chaudhary and Piracha 2021). So, disasters are not only physical events, but they also have social, economic, political aspects, too.

Chapter 2 includes disaster types, disaster theories, disaster risk management explanations and disaster risk assessment. First, categories of disasters are detailed. Then disaster theories are explained to better understand how the perspective on disasters has changed from past to present. And in the final part of this chapter, disaster management and disaster risk assessment are examined. Risk reduction is critical for a manageable earthquake. First step of the earthquake risk management is spatial analysis, which various disciplines provide such as engineering and geology mostly. But that kind analysis must be readable and understandable by planners. Plans created by using that analysis should prepare cities for earthquakes and secondary disasters triggered by earthquakes. In this respect, this thesis serves as a guide for planners.

Chapter 3 includes, explanation of earthquake event, development process of earthquake risk management and practices in the world. Earthquake is not a physical event alone; it has different dimensions and other events or disasters it triggers. That is why, this thesis adopts a holistic approach to disaster. After presenting information on earthquake formation, faults, earthquake intensity, magnitude and earthquake triggered disasters, earthquake risk management development and practices in both the world examples and Turkey is given. Japan, United States of America, Canada, Italy, and France is chosen as world examples.

Chapter 4 examines legal and institutional background of earthquake risk management in Turkey detailly. Assessment of Turkey's earthquake risk is crucial because it is one of the riskiest countries for earthquake disasters worldwide. This thesis gives development process of earthquake risk management in Turkey and its legal and institutional background, with comparisons of world. As a method, period categorization

was made by referring to the planning periods in Turkey and important breaking points in terms of earthquakes. These periods coincide with the post-republic period, which includes the instrumental period, and are examined chronologically.

In Chapter 5, the case study area of the thesis (Mansuroğlu, Manavkuyu and Adalet Neighbourhoods of Bayraklı) is examined. Firstly, general characteristics of İzmir which includes information such as earthquake risk and hazard, active faults, earthquake history, development and planning history are explained. Earthquake risk management in planning of İzmir and, earthquake scenarios and risk assessment of İzmir are discussed. Then, the focus is shifted to Bayraklı district and study area. General characteristics of the study area which includes information such as earthquake risk and hazard, planning history, assessment of Samos earthquake is explained.

Finally, in sixth chapter the legal and institutional framework for earthquake risk management in terms of spatial planning in Turkey and the plans of the study area are compared and evaluated. And in the conclusion chapter, recommendations for improvement of spatial plans in terms of earthquake risk management are presented. These recommendations also emphasize the role of planning processes in increasing the earthquake resilience of cities.

1.5. Key Terminology

1.5.1. Hazard

United Nations International Strategy for Disaster Reduction (UNISDR) defines hazard as "a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage" (2009). The definitions of FEMA (2001) and AFAD (2014, 144) are also similar with this. The emphasis is that it may originate from nature or technology, threaten life and society, harm the environment, resources (natural, cultural, historical, etc.) and the economy. It can be explained as the potential to cause disasters of events occurring by nature or human. It is harmless in itself, but it has potential harm. Thus, it characterized as threats

Hazards are necessary but not sufficient condition for a disaster to occur. They arise from the interaction between natural, technological, and social systems (Cutter 2001; Chaudhary and Piracha 2021). They are inherently spatial phenomena and have their source in a certain place, have a specific geographic impact. “In technical settings, they are described quantitatively by the likely frequency of occurrence of different intensities for different areas, as determined from historical data or scientific analysis” (UNISDR 2009, 17). “They may be single, sequential, or combined in their origin and effects. Each hazard is characterized by its location, intensity or magnitude, frequency, and probability” (UNDRR 2020).

Table 1. Assessing Hazards Categories

Source: (U.S. Federal Aviation Administration 2022)

Assessment according to:	Category	Explanation
Severity	Catastrophic	Loss of life; complete equipment loss
	Critical	Accident level injury and equipment damage
	Moderate	Incident to minor accident damage
	Negligible	Damage probably less than accident or incident levels
Probability	Frequent	Probably will occur very often
	Likely	Probably will occur often
	Occasional	Expected to occur occasionally
	Seldom	Expected to occur on a rate basis
	Unlikely	Unexpected, but might occur

"Hazards include biological, environmental, geological, hydrometeorological and technological processes and phenomena" is mentioned in the Sendai Framework for Disaster Risk Reduction 2015-2030. Also, the impact of hazards on disaster and disaster management are highlighted, the necessity of classification of them is emphasized. In this direction, UNDRR prepared "Hazard Definition and Classification Review Technical Report" in 2020. This classification is extremely critical in terms of risk assessment. According to the report hazards are classified under eight main categories as in Table 2.

Table 2. Classification of Hazards

Source: (UNDRR 2020)

Hazard Type	Hazard Cluster
Biological	Aquaculture, Insect infestation, Invasive species, Human-animal interaction, CBRNE (Biological agents), Mental health, Food safety, Infectious disasters (Plant, Human-animal, Aquaculture)
Chemical	Gases, Heavy metals, Food safety, Persistent organic pollutants (POPs), Hydrocarbons, CBRNE (Chemical agents), Other chemical hazards and toxins, Aquaculture (marine toxins)
Environmental	Environmental degradation (and forestry) (such as air pollution, land and soil degradation, source pollution, biodiversity loss, soil erosion, coastal erosion, and shoreline change etc.)
Extra-terrestrial	Extra-terrestrial (such as airburst, geomagnetic storm, UV radiation, meteor impact etc.)
Geohazard	Seismogenic (earthquakes), Volcanogenic (volcanoes and geothermal), Shallow geo-hazard
Meteorological and Hydrological	Convective-related, Flood, Lithometeors, Marine, Pressure-related, Precipitation-relates, Temperature-related, Terrestrial, Wind-related
Technological	Radiation, CBRNE (Radiation, nuclear and explosive agents), Construction /structural failure, Industrial failure / non-compliance, Infrastructure failure, Cyber hazard, Waste, Flood, Transportation
Societal	Conflict, Post-conflict, Behavioural, Economic

1.5.2. Vulnerability

Vulnerability is defined as, “the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard” (UNISDR 2009, 30). It has many aspects. It represents a collection of human conditions that are a result of social, political, environmental, cultural, economic, and historical contexts. It

refers to probability of exposure, susceptibility and physical, social, economic, or environmental loss and damage's measure (AFAD 2014, 166; Değerliyurt 2015; Chaudhary and Piracha 2021). In this context, it includes the effects of the hazards on exposed elements (human beings, buildings, livelihoods etc.). “The extent of vulnerability depends on the construction, predisposition, fragilities, inherent capacity, or weakness of the exposed elements” (Thywissen 2006; Chaudhary and Piracha, 2021). It is divided into three categories: physical vulnerability, social vulnerability, and economic vulnerability.

Table 3. Categories of Vulnerability

Source: (AFAD 2014, 166)

Type	Explanation
Physical	Man-made structure, infrastructure, environment, agriculture, industry, production, etc. It covers the vulnerabilities of physical elements and the physical capacities of human communities. It is possible to measure or quantify
Social	It is the degree of damage or vulnerability that individuals and society may be exposed to due to psychological, sociological, and demographic factors, which is difficult or even impossible to measure
Economic	Includes factors such as how communities organize their lives economically, how their livelihoods and capacities are

1.5.3. Exposure

In lexical meaning, exposure is defined as “the fact of experiencing something or being affected by it because of being in a particular situation or place” (Cambridge Dictionary n.d.). It means “people, property, systems, or other elements present in hazard zones that are thereby subject to potential losses” (UNISDR 2009, 15). Human beings, dwellings, households, communities, structures, buildings, facilities, infrastructural systems, commodities, assets (cultural, environmental, ecological etc.) can be examples of those exposed elements. They are under threat of potential damage, especially when located in risky areas such as disaster regions.

Exposure and vulnerability are different concepts. However, it is sometimes misused and confused with each other, including in the literature. Exposed not means vulnerable. However, being exposed is necessary for being vulnerable (Cardona et. al. 2012). It is mentioned before, hazard is a necessary but not sufficient condition for a disaster to occur. The same is valid for exposed to a hazard. For instance, an element may be exposed to hazard but withstand, and this capacity may be sufficient to avoid disaster (Chaudhary and Piracha 2021).

1.5.4. Risk

"Risk is the estimated impact that a hazard would have on people, services, infrastructure, and physical assets in a community" (Chaudhary and Piracha 2021). It means possible loss, harm, and damage on values such kind of human being, economy, environment, property of an event in certain conditions (AFAD 2014, 128). Disaster risk refers to the probability that a hazard event will turn into a disaster. It was explained before with a common accepted formula:

$$\mathbf{Risk (R) = Hazard (H) \times Vulnerability (V)}$$

But later, the idea that, the disaster risk depends on exposure and vulnerability combination gained acceptance.

$$\mathbf{Risk (R) = Hazard (H) \times Vulnerability (V) \times Exposure (E)}$$

And in the last studies, other components are added to this formula (Wisner 2004; Chaudhary and Piracha 2021)

$$\mathbf{Risk (R) = Hazard (H) \times [(Vulnerability (V) / Protection Capacity(C)) - Mitigation (M)]}$$

(C) represents the personal protection capacity and (M) represents the larger scale risk mitigation measures at the societal level.

These all formulas are not exact mathematical evaluations, they correlate relations of various factors only.

1.5.5. Resilience

Resilience is defined as “the capacity of an individual or community to timely and effectively predict, anticipate, prevent, mitigate and ameliorate the effects of a hazardous occurrence” (AFAD 2014, 64). Disaster resilience means “the capacity of a system, society or community that is open to hazards to be resistant to disaster hazards, to cope with it, and to heal by eliminating the effects of disasters in a short time” (AFAD 2014, 33). It is related to the coping capacity and refers to the processes of foreseeing the danger and its effects, adapting to this situation, taking precautions, mitigation, and recovery processes.

1.1.1. Crisis

In lexical meaning, crisis is defined as “a difficult period, depression, depression in a country or between countries, in the life of a society or an organization” in the Turkish Language Society (TDK) (n.d.), and “a situation or time that is extremely dangerous or difficult” (Cambridge Dictionary n.d.). It means “the occurrence of physical, social, economic and political events that disrupt the normal order and have the potential to have negative consequences for society” (AFAD 2014, 107). Basically, the unexpected are unstable, destructive states that significantly disrupt the normal system or cause decisive changes.

1.5.6. Emergency

Emergency is defined as “a serious or dangerous situation that needs immediate action” (Cambridge Dictionary n.d.). It means “all situations and situations that require urgency, of a magnitude that can often be dealt with by local means” (AFAD 2014, 20). Basically, it refers to “the events that stop or interrupt the normal life and activities of the whole or certain segments of the society and that require urgent intervention and the crisis situation created by these events” (AFAD 2014, 20).

1.5.7. Disaster

Disaster means “a terrible event, especially one that causes great damage, loss” (Cambridge Dictionary n.d.). Some institutions underline similar points in the definition of disaster. AFAD (2014, 23) defines it “an event caused by nature, technology or human beings that causes physical, economic and social losses for the whole or certain segments of the society, stops or interrupts normal life and human activities, and the coping capacity of the affected society is not sufficient”. Centre for Research on the Epidemiology of Disasters (CRED) (Below et. al. 2009), adds " it exceeds local capacity, requiring a national or international request for external assistance; an unforeseen and often sudden event”, to this definition.

While defining the concept of "disaster" itself, the consequences of the disaster are also included in this definition. Hazards and risks cannot be considered as disasters on their own. For an event to be defined as a disaster, settlements and society must negatively affect. Disaster is a real event with negative consequences that differ from hazard and risk, a dangerous event that occurs in a deserted area and does not affect the community is not called a disaster (Chaudhary and Piracha 2021).

Spatial developments and settlements that have occurred by considering the hazards and risks, can reduce or eliminate the negative effects of disaster because of the lower impact on the society. This is the basis idea of the disaster prevention approach and the studies on disaster management. And spatial planning regulates settlements, affects society directly, organizes daily flows and activities. That is the reason for it is backbone of the disaster risk management.

CHAPTER 2

DISASTER TYPES, THEORIES, RISK MANAGEMENT AND RISK ASSESSMENT

2.1. Classification of Disasters

Classification of disasters form the basis of risk assessment, identification of triggered disasters and risk assessment in spatial analysis and synthesis processes. There are various classifications. This difference varies according to countries, regions, institutions, experts, and people carrying out disaster studies. A disaster can be included in more than one type. In this study, four most frequently used ones are determined with literature review. These are made according to the source, intensity or magnitude, spatial scale (borders of influenced area) and process (formation rate) of the disasters. For this determination, institutions such as FEMA¹, CRED² and AFAD³, referenced. Because they are critical in terms of producing spatial data on disasters.

Disasters divides into two categories according to their source: natural and man-made (or technological). Most used one is this categorization in data collections or studies. But there is also hybrid disaster classification additional to them. Hybrid disasters covers disasters resulting by human-induced factors triggering natural hazards. Natural disasters cover disasters triggered by hazards occurring as a natural process and interacting with the built environment. They are divided into six categories: geological,

¹ FEMA, “Disaster Declarations”

² Below, et. al. 2009

³ AFAD, “Afet Türleri”

hydrological, meteorological, climatological, biological, extra-terrestrial. Geological disasters originate from earth's crust (earthquakes, mass movements, volcanos etc.). Hydrological disasters are water-based formation, distribution, and movements (flood, wave etc.). Meteorological disasters originate from atmospheric conditions (storm, cold and heat waves, frost etc.). Climatological disasters relate to changes in climate over a wide period (drought, glacier movements etc.). Biological disasters originate from living thing or substances, such as bacteria, viruses, mildew, poisons, hormones (epidemic, infection disease, animal invasions etc.). Extra-terrestrial disasters originate from outside the atmosphere of earth (asteroids, meteorites etc.). Man-made or in other words technological disasters occur because of people's work, production. There is not a cause-effect relationship with natural hazards. They divide into two categories: accidents or deliberate. Accidental ones originate from neglect and misuse of man-made systems (industrial fires, mining explosions etc.) and deliberate ones refer to the intended use of man-made systems (violence, wars, attacks etc.) (Degerliyurt 2015; Çelik et. al. 2020).

Classification according to magnitude or intensity of disasters refer to a measurement with a scale. Magnitude is a quantitative measure; intensity is a qualitative measure. Classification according to spatial scale of disasters refer to both location of the disaster occurrence, and borders of influenced area. There are two categories in this kind of classification: regional and global disasters. Sometimes a regional disaster can affect other regions, country, or countries. The transformation of the Covid-19 epidemic that emerged in China into a pandemic by spreading all over the world is an example of the transformation of a regional disaster into a global one. Classification according to process of disasters refers to rate of formation a disaster. There are basically two categories: rapid onset and slow onset. Suddenly and unexpectedly occurred ones are rapid onset disasters. Earthquake, floods, spate, landslides, rockfalls, avalanche, storms, tornadoes, volcanoes, fires can be given as examples (AFAD 2014, 39). Slow onset disasters refer to long term. Negative consequences increase gradually in time. Global warming, drought, erosion, desertification, and social disasters such as disruption of social balance can be given as examples (AFAD 2014, 160). Human activities can be effective in the occurrence of such disasters or in accelerating their processes. However, it is easier to implement risk-reducing, disaster-preventing policies, and plans in slow onset disasters than in rapid onset disasters.

2.2. Disaster Theories: Historical Perspectives of Disasters

Handling of disasters has changed from past to present. Theories were developed mostly around natural disasters until the post-modern era. Because disasters were based on extraordinary powers in the pre-modern era, nature in the modern era, and human in the post-modern era (Quarantelli 2000; Alkin 2020). In the pre-modern era, before the reforms like the renaissance, science was not developed in the world and religious values were dominantly effective on people. However, with modernism, positive sciences developed and the nature itself became the focus of the disasters. And in the post-modern era, events such as the II. World War, atomic bombs, and nuclear power plant explosions turned the focus of the view on disasters to man-made (human and technology based) disasters.

Previously, disaster thoughts and studies were focused on theoretical explanation and definitions. Afterwards, the focus shifted to evaluation of disasters in terms of risks and hazards. And today, disasters are handled within the "disaster risk management" guideline. In the pre- modern era, disasters were largely perceived as God's way of punishing people (Quarantelli et.al. 2007, 19). Then they were begun to be seen as events that can be predicted, prevented or the effects of which can be reduced as a reaction of nature with modernity and secularization (Furedi 2007, 483). This can be read as an important mentality transformation and a stimulating development in terms of disaster management and combating disasters. Understanding of this transformation is a necessity for the disaster risk management processes. As Chaudhary and Piracha (2021) mention, there are four (natural) disaster theories:

1. Disaster as a Retribution (An Act of God): It refers to a fatalistic perspective. It regards disasters as “a divine retribution for human misdeeds and failings” (White et. al. 2001). It argues that the damages caused by disasters are not in the hands of people (Ruiu 2012).

2. Disaster as a Physical Phenomenon (An Act of Nature): The perspective shifted from "supernatural paradigm" to "natural physical reality". By the early 20th century, it gained widespread acceptance. Because with the Renaissance, perspectives of scientific ideas changed, science progressed, studies about natural hazards (their source, occurrence, future predictions etc.) and engineered solutions developed. However, despite

the adoption of engineering solutions, increased or not decreased losses and damages due to natural disasters continued. Thus, it was understood that the engineering methods developed only according to the physical space were not the solution.

3. Disaster as an Act of Nature-Human Interplay: Carr (1932) suggested that, firstly, "disasters occur due to the interaction between a geophysical (natural) system and a human use system, and the absence of either does not result in a disaster". Natural hazards occurring in a deserted area cannot be qualified as disasters as they do not directly harm human and the human-built environment. Disasters have social dimension. The theory about social dimension of disasters was put forward by White (1936) firstly. Thus, Barrows' (1923) concept of "human ecology" began to be advocated in disaster frame. This concept describes the need to improve the society besides improvement of the natural environment and land use planning. Such planning, it is suggested, would decrease the negative effects of natural hazards on settlements.

4. Disaster as a Complex Nexus of Natural-Human-Social-Economic Factors: The focus is on that certain segments of the population are more affected by natural disasters and are more vulnerable, in that theory. At the end of the 20th century, the interaction between the development level of countries and natural disasters began to be investigated (UNDP 1994). Research has revealed that disaster deaths in underdeveloped countries are higher than in developed ones, and the economic loss, which means the cost of disaster, is also disproportionately high in terms of GDP per capita (Smith 2013; Linnerooth-Bayer and Amendola 2000). Thus, vulnerability to natural disasters was associated with underdevelopment. This situation led to the questioning of the concept of "natural disasters", which refers to being caused by nature. Researchers and actors began to work on disaster risk management, which includes the unnatural factors that are responsible and effective in the transformation of natural hazards into disasters.

The view emerged that; people are not victims of natural disasters, natural disasters are manageable even if natural hazards are not prevented, and natural disasters are related to unnatural factors. The view became widespread that; the exploitation and commodification of natural resources and people, and the inefficient functioning of economic, political, and social systems, increases vulnerability. The potential of some countries or parts of society to be damaged by disasters is increased by human hands. Therefore, disaster risk management represents requirement of equal distribution, participation and poverty reduction in planning practices and processes.

That transformation process of disaster theories is also an important mentality transformation and a stimulating development in terms of disaster perception and disaster risk management. This transformation led multidimensional structure of disasters. It means that there are necessitates a multidisciplinary and integrated perspective on disasters.

2.3. Disaster Risk Management

"Disaster", "crisis" and "(disaster) risk" concepts explained deeply in previous chapters. In this part, "disaster management", "crisis management", "disaster risk management" concepts will be explained.

Disaster management is defined as "an all-out struggle process that should be done by the society" (AFAD 2014, 33). It is a multidimensional, strategic, dynamic, complicated, and cyclical process. It refers to the situation of planning, directing, coordinating, and implementing the preventions and studies to be taken for the disaster. It requires multi-disciplinary process with many actors in which institution, organization, resource, priority, mission, vision etc. are determined. It covers the pre-disaster, the moment of the disaster and the advancing process after the disaster. Only post-disaster interventions are insufficient, pre-disaster measures must also be taken. These measures will reduce the negative effects of the disaster. But they are also critical for managing disaster at its moment and post. To this, process must be planned step by step before disaster. And the plan made for this purpose is called a "disaster management plan" in the general sense.

Disaster management is the priority necessity for create earthquake resistant cities. There are two basic elements of it: "crisis management" and "risk management". But in detail, it has four main phases: "response", "recovery", "mitigation", "preparation". Response and recovery phases are related to crisis management, that is, they cover post-disaster processes. Mitigation and preparation phases are related to risk management, that is, they cover pre-disaster processes.

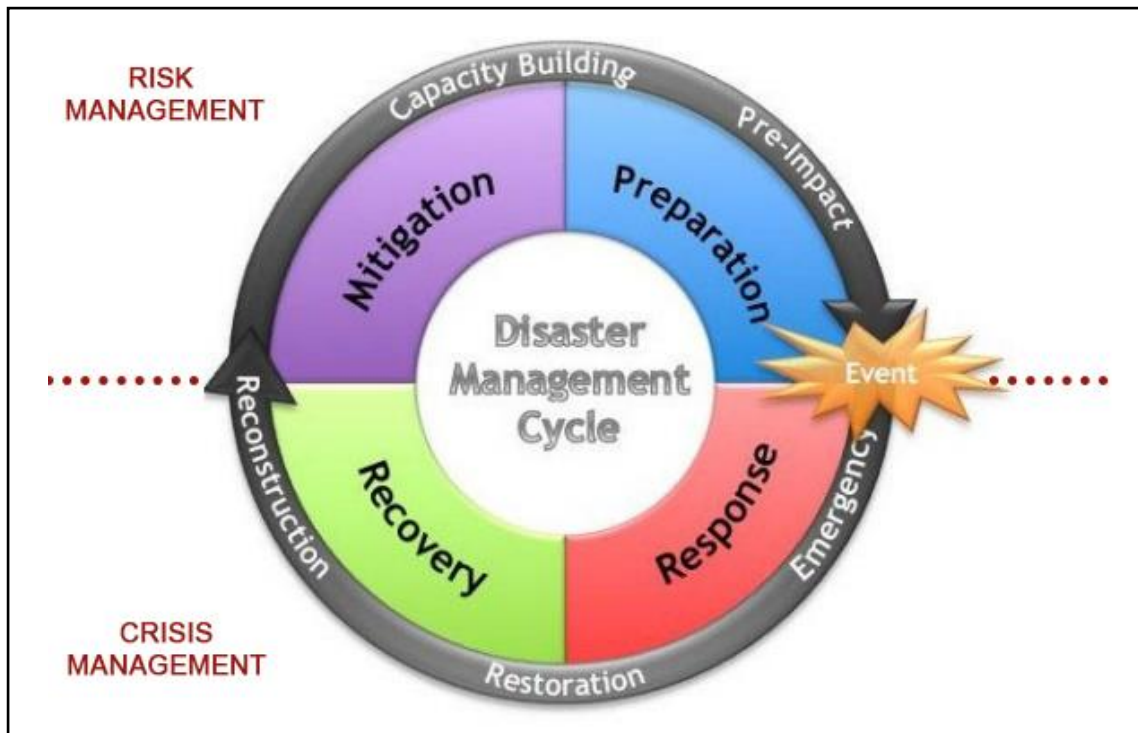


Figure 2. Disaster Management Cycle

Source: (Hiscock et. al. 2011)

Crisis management means "a temporary form of management that is applied during the crisis conditions and aims to normalize the situation" (AFAD 2014, 107). It is momentary, non-permanent. It ends too when the event that caused it to occur is over. The phases of crisis management:

1. Response: It is the first phase that starts with the occurrence of the disaster. "It is predominantly focused on immediate and short-term needs and is sometimes called disaster relief" (UNISDR 2009). It includes search and rescue, health, food, shelter, clothing, water and treatment supply services, damage assessment, aid coordination (AFAD 2014, 116). The aims are to save lives, ensure public safety, meet basic needs, and continue basic activities in case of disaster.

2. Recovery: It refers to the period after the disaster response, in disaster management. It starts after the emergency phase ends. It covers all the necessary institutional, physical, social, and economic activities for normalization of the disaster area (AFAD 2014, 94). It includes meeting the long-term needs of the exposed. It is mostly related to reconstruction or restoration. But it also includes reducing risk factors efforts with predetermined

policies and strategies. UNISDR suggests that the basic approach should be the implementation of the "Built Back Better (BBB)" principle in this phase (Sendai Framework for Disaster Risk Reduction 2015-2030). Disaster is used as a trigger to create nations and societies that are more resilient than before according to the BBB principle.

Disaster risk management means "the process of determining and analysing the hazard and risk at the scale of the country, region, city or settlement, determining the opportunities, resources and priorities for reducing the risk, preparing and implementing policy and strategic plans and action plans" (AFAD 2014, 31). It is a crucial and necessary part of the process for minimize loss of lives and poverty. While crisis management is concerned with the manageability of the disaster and crisis phase, disaster risk management is concerned with not turning the hazard into a disaster or causing less damage, that is, reducing the risk. The phases of risk management:

3. Mitigation: It means prevention hazards from turning into disasters, reduction, and limitation of negative effects. It refers all the measures that cover before, during and after the disaster. It requires long-term and multidisciplinary studies with many institutions and organizations. In practice, it starts in the recovery phase and continues until the next disaster. The scope and scale of implementation is very wide. The risk cannot be destroyed. Absence of the risk, in disaster management is not achievable goal. The scale or severity of the damage can only reduce with some strategies, policies, or actions. That's why this phase called mitigation not elimination etc. In mitigation perspective, developed engineering methods, regulations and legislations, resilient structural technologies, public awareness can be given instance for that strategies, policies, or actions.

4. Preparation: It is defined as "the knowledge and capacities developed by governments, professional response and recovery organizations, communities, and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent, or current hazard events or conditions" (UNISDR 2009). In other words, it means being ready for a disaster. Readiness refers to the capacity to react effectively and promptly when necessary. And preparation phase is the process in which activities such as planning, education, operation, early warning systems, emergency aid material stocks, informing and raising awareness of the public are carried out continuously and sustainably for rapid, punctual, efficient respond (AFAD 2014, 34). The aim is to manage the disaster effectively and ensure a rapid transition to the recovery process with legal, institutional, budgetary supports.

2.4. Disaster Risk Assessment

Disaster risk assessment (DRA) is a disaster risk calculation in a mathematically expressible way (AFAD 2014, 31). The resulting contributes to increased disaster resilience in studies and provides a basis for knowledge generation for prioritization, strategy, and action design. It identifies and analyses the different natural hazard event kinds, probabilities, and intensities as well as their effects on people, communities, and assets in a specific geographic area. It aims to further facilitate risk-sensitive decision making. “It is based on an analysis of the three components of disaster risk: hazard characteristics, elements at risk, and the vulnerability of those elements” (ADB 2017). It includes type, location, probability, intensity and frequency of hazards, exposure and vulnerability analysis, dimensions of risk. Both qualitative and quantitative approaches can be used for DRA. They should determine potential hazards, extent and nature of the risk and evaluate existent situation, exposure and vulnerability of disaster, potential harm to people, facilities, properties etc. As mentioned before the general mathematically acceptance in disaster risk assessment is:

$$\text{Risk (R)} = \text{Hazard (H)} \times \text{Vulnerability (V)} \times \text{Exposure (E)}$$

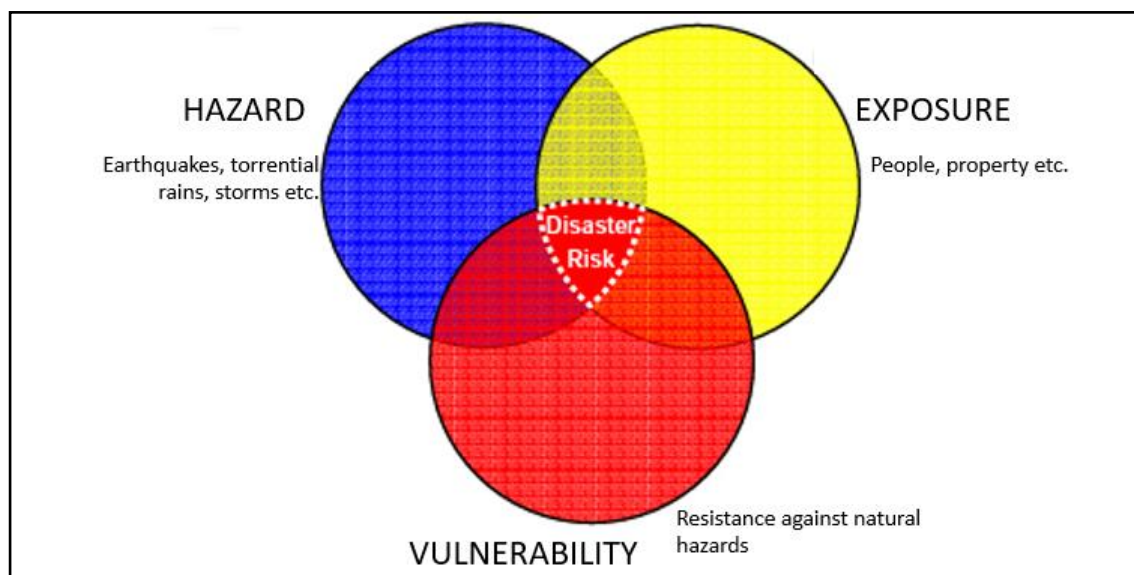


Figure 3. Mechanism Behind the Emergence of Natural Disasters

Source: (ADPC 2005)

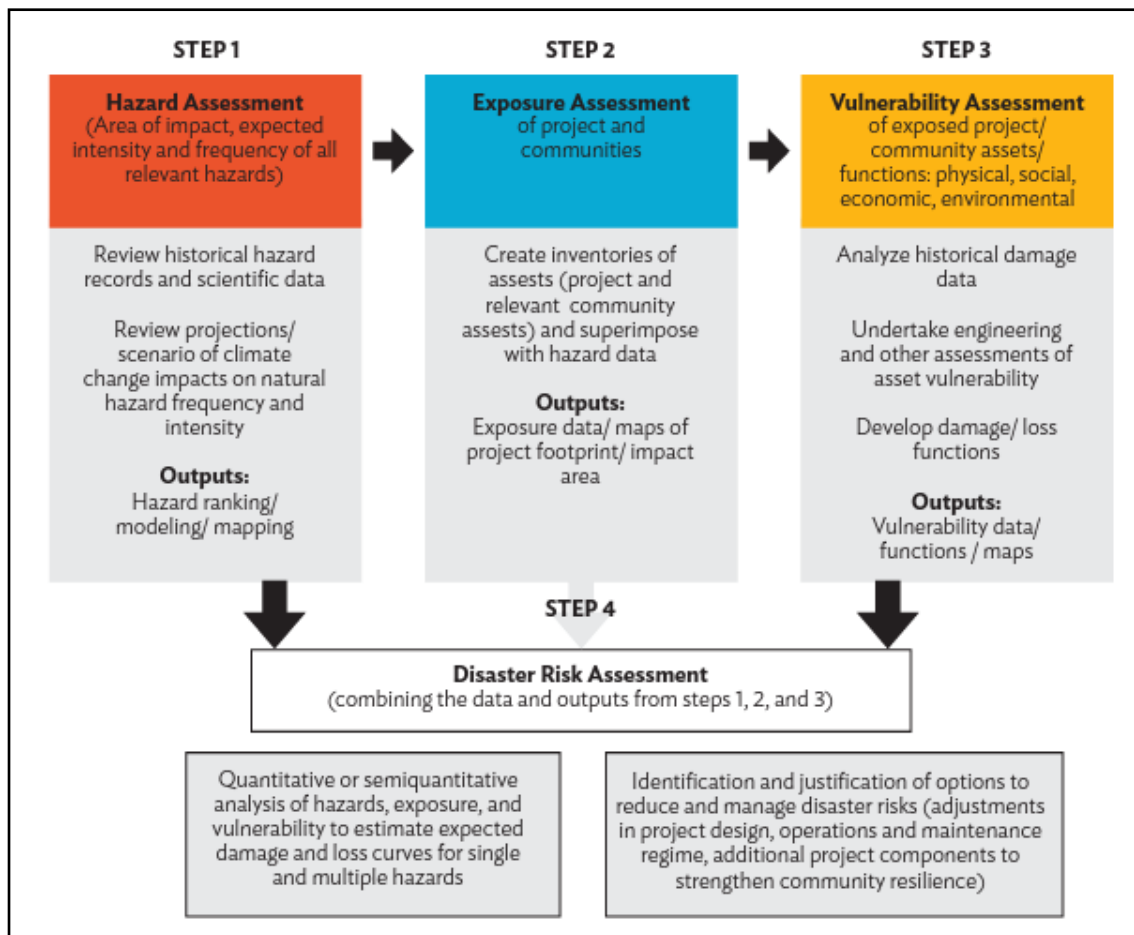


Figure 4. Disaster Risk Assessment Process

Source: (ADB 2017)

1. Hazard Assessment: It refers to finding potential threats to the environment or system under study. At the beginning, it is important to identify all potential hazards and their probability. Some inputs of the process are location, probability, history, intensity, frequency, experimentation, modelling, testing. In practice, very low probability ones are ignored. Focus is on more occurred, preventable, or mitigatable ones.

2. Exposure Assessment: It means determination of the exposure. It aims to determine who, what and which elements are at risk.

3. Vulnerability Assessment: It refers to determining a risk's level of vulnerability. It is determining and estimating to the physical, social, or financial impact on the exposed entities should the event occur. It includes also estimating the potential different consequences of disasters which have different magnitudes.

CHAPTER 3

EARTHQUAKE, DEVELOPMENT OF EARTHQUAKE RISK MANAGEMENT AND PRACTICES IN THE WORLD

3.1. Earthquake

Earth is a dynamic and energetic planet. And earthquake is a result of the internal dynamics of the earth. It is related to the tectonic plate boundaries and movements. There are many theories put forward regarding the movement of plates. The most well-known of these theories is the Continental Drift Theory (Plate Tectonics Theory), which suggested by Alfred Wegener in 1900's beginning. It forms the basis of geological explanations such as volcanoes, earthquakes etc. According to this theory, the earth's crust consisted of two parts in the beginning: the continents in single plate were called "Pangea" (approximately 30% of the earth's surface) and the surrounding ocean was called "Panthalassa" (covered the remaining 70%) (Borg 1990). Over time, major landforms created such as different continents, seas, etc., with the movements of the earth's crust. Today, there are seven major plates: Africa, Antarctica, Australia, Eurasia, North, South America, Pacifica, and several minor plates also (Hasterok et al 2022). However, these are still moving and are going to be change slowly. The smallest soil grain at these is called "sediment". It is a naturally occurring material. It is transported mainly by force of gravity, that's why it tends to be stored horizontally. Over time, sediments accumulate and form layers on top of each other. This geological formation can be called "soil layers". However, the horizontal order can be disrupted by the movements of the tectonic plates. As a result of friction between plates, energy accumulates. Thus, layers can bend, stretch, break due to stress changes, which means the tension or compression of the tectonic plates, in the region. Shortly, the soil, which is compressed from two directions, changes

shape over time with the effect of this force and breaks after a while. These breaks occur due to low or loss of ground / soil resistance and elasticity. The main shock, which is the first movement that occurs, is defined as "earthquake" (AFAD 2018). And the broken axis is defined as "fault line". This shock sometimes escalates with hum and noise. Earthquakes with less magnitude that occur before major earthquakes are called "foreshock". And earthquakes that occur after a strong earthquake are also called "aftershocks". These earthquakes continue for a long time and allow the underground layers broken by the big earthquake to settle well.

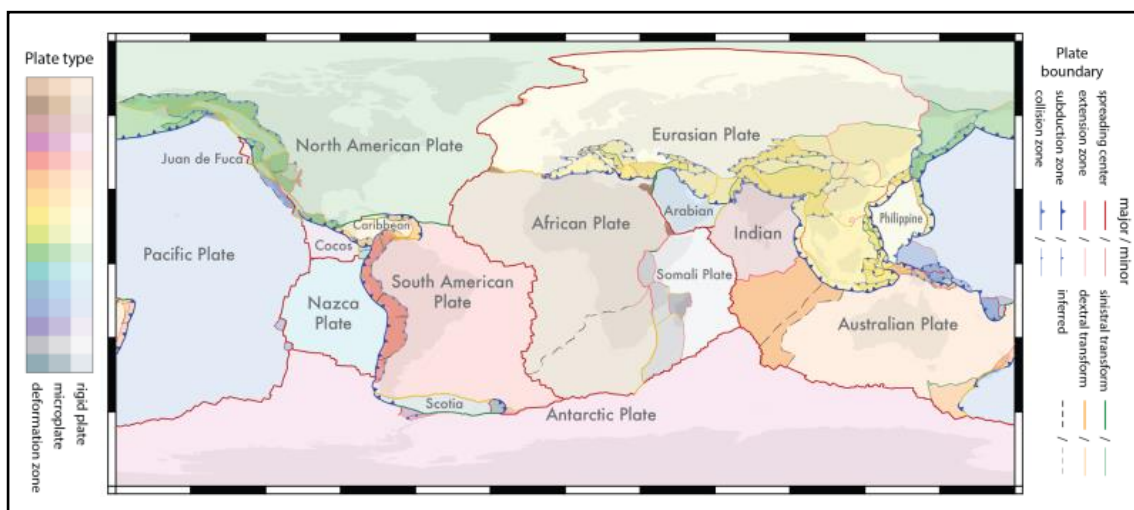


Figure 5. Tectonic Plates of Earth Today

Source: (Hasterok et al 2022)

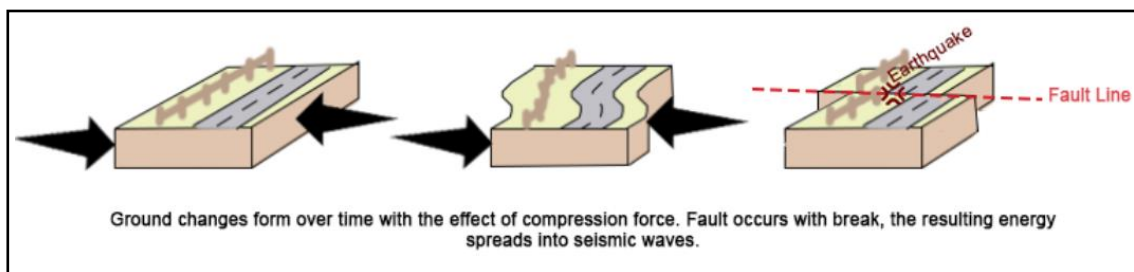


Figure 6. Theory of Faulting

Source: (AFAD 2018; Revised by author)

In summary, earthquake is spreading seismic waves and shaking earth strongly, caused by energy emerged because of breaking crust (AFAD 2014, 58). These shakes only can last for a few minutes or seconds but occur anywhere at any time. Knowing how and when exactly earthquakes will occur, is impossible. However, it is possible to determine the earthquake risk thanks to earthquake statistics, seismic data, geological technics, and measurements. And fault is "broken and displaced part of the earth's crust by the effect of tectonic movements" (AFAD 2014, 73). In other words, weak lines, or zones where there are plate movements and breaks that make up the earth's crust are faults. Faults zones have earthquake risks in the most basic frame. These faults can be determined with geological technics and studies. There are three main types of faults: normal, reverse, strike-slip.

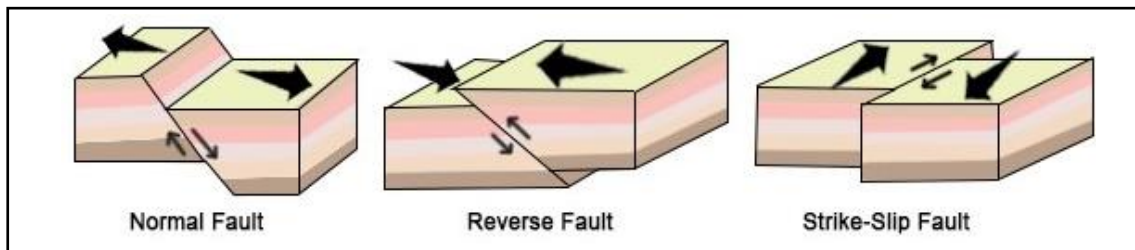


Figure 7. Fault Types

(Geology Page 2017, Revised by author)

Fault types are very important earthquake risk management in spatial planning. It should be considered as basic data in determining the construction conditions, settlement types and earthquake avoidance/buffer zones of the settlements around the fault line. Generally, in normal faults and reverse faults, both sides of the line are not affected equally. For instance, as shown in Figure 7, in that kind of reverse fault, it is expected that a subsidence occurs on the left side, or the right side move over the left side. Therefore, the greater possible damage on the left side should be anticipated and in the spatial plans at all different scales the buffer zone on the left side should be larger than on the right side.

On the other hand, magnitude and intensity of the earthquake are critical in terms of damage and destruction. In planning process, probable magnitude and intensity values

of a possible earthquake and its historical background should be known. Nevertheless, the differences between these two concepts are mostly confused. Intensity of earthquake refers to impact degree. It includes such kind of parameters loss of lives, economical losses, structural or non-structural harms. It gives damage degree, distribution, and variation. It varies from region to region, but generally decreases with distance from the earthquake's outer focus. There are various intensity scales developed to measure earthquake intensity. The most widely used one of them is the Modified Mercalli (MM) Intensity Scale. It is purely based on apparent information. “The scale, which was first introduced by Giuseppe Mercalli in 1902, was developed by Harry Wood and Frank Neumann in 1931 and took its current form” (Torun 2023).

Table 4. Earthquake Intensity according to Modified Mercalli (MM) Intensity Scale

Source: (Kaypak 2017; Earth Science 2018)

Intensity	Category	Explanation / Effects
I	Instrumental	Instruments can notice only
II	Very feeble	Can be felt very rarely
III	Slight	Can be felt rarely
IV	Moderate	Can be felt by people in motion, some objects may swing
V	Rather strong	Can be felt easily, some objects can damage, people can awaken
VI	Strong	Can be felt by all, people can frighten, damage slight can be
VII	Very strong	Can be felt even people in autos, can damage to poor construction
VIII	Destructive	Can be much damage in buildings, generally furniture overturned
IX	Ruinous	Can be great damage to structural elements (ground, pipes etc.)
X	Disastrous	Many buildings destroyed
XI	Very disastrous	Few structures left standing
XII	Catastrophic	Totally destruction

Earthquakes recorded with instrumental measurements since 1900 are called "instrumental period earthquakes" (AFAD 2014, 38). There are only observational data on earthquakes before this period. Therefore, studies on earthquakes that occurred after

1900s yield more reliable and meaningful results. This thesis considers the instrumental period a milestone. Magnitude of earthquake represents this period. It was described firstly by Charles Francis Richter in the 1930s. "The magnitude is characteristic of the shock as a whole; it thus differs from the intensity, which varies from point to point of the affected area" (Richter 1935). It represents to the energy released because of an earthquake (AFAD 2014, 62). It is a value found because of measurement and calculation because energy cannot be measured directly. Seismic wave data recorded with a seismograph is used for calculation. There are various calculation methods and formulas. The most used magnitude values in seismology are Mb (Body Wave Magnitude), Ms (Surface Wave Magnitude) and Mw (Moment Magnitude). The first method is developed by Richter and Gutenberg (1936) and called as "Richter Scale". "It is quantitative measure of an earthquake's magnitude (size)" (Rafferty 2023) and still used today.

Table 5. Earthquake Magnitude according to Richter Scale

Source: (Rafferty 2023)

Magnitude	Category	Explanation / Effects
Less than 3.0	Micro	Generally, not be felt, but recorded by seismograph
3.0 – 3.9	Minor	Can be felt, but not damage
4.0 – 4.9	Light	Often be felt, can cause minor damages
5.0 – 5.9	Moderate	Cause slight damage to weak structures
6.0 – 6.9	Strong	Moderate damage in populated areas
7.0 – 7.9	Major	Serious damage over large areas and loss of life
8.0 and higher	Great	Severe destruction and loss of life over large areas

An earthquake has only one magnitude value. The variation in magnitude differs only in terms of seismographic units. However, the intensity value of the earthquake varies according to the affected regions. Different intensity values can be assigned to different regions for the same earthquake. At this point, it can be said that the depth of hypocentre (the earthquake's focus) and man-made factors are significant. "Some empirical relationships have been drawn between the intensity and magnitude of earthquakes" (AFAD 2019). However, these relationships may vary according to the

region. The transformation between intensity and magnitude values from these relations for Turkey is shown in Table 6.

Table 6. Earthquake Magnitude and Earthquake Intensity Relation

Source: (AFAD 2019)

Intensity	IV	V	VI	VII	VIII	IX	X	XI	XII
Magnitude	4.0	4.5	5.1	5.6	6.2	6.6	7.3	7.8	8.4

Also, there is another highlight. Earthquake should not be considered as a hazard and disaster on its own. Because it usually leads to a secondary trigger. Especially in urban areas, secondary disasters triggered after an earthquake pose a great risk. So, it is a very wrong, primitive, incomplete and inadequate approach to handle hazards alone or with only one effect” (Kadioğlu 2011). The secondary earthquakes that may occur related to the earthquake are shown in Figure 8.

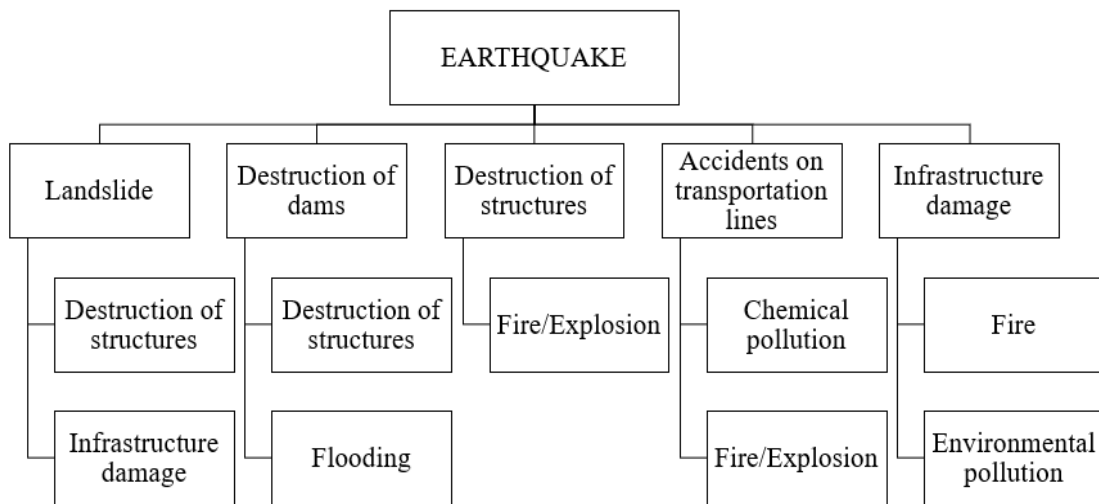


Figure 8. Earthquake Triggered Secondary Disasters

Source: (Kadioğlu 2011, 25; Gökçen 2020, 56)

Table 7. Example of Measures in Each disaster Risk Management Phase

Source: (ADPC 2005)

Disaster Phase	Earthquake	Flood	Landslide
Prevention/ Mitigation	Seismic design, retrofitting of vulnerable buildings, installation of seismic isolation/ seismic response control systems	Construction of dike, building of dam, forestation, construction of flood control basins/ reservoirs	Construction of erosion control dams, construction of retaining walls
Preparedness	Construction and operation of earthquake observation systems	Construction and operation of meteorological observation systems	
	Preparation of hazard maps, food & material stockpiling, emergency drills, construction of early warning systems, preparation of emergency kits		
Response	Rescue efforts, first aid treatment, firefighting, monitoring of secondary disaster, construction of temporary housing, establishment of tent villages		
Rehabilitation/ Reconstruction	Disaster resistant reconstruction, appropriate land use planning, livelihood support, industrial rehabilitation planning		

3.2. Development Process of Earthquake Risk Management and Practices in the World

Knowing how to live with earthquakes as in the developed countries of the world and developing policies to overcome it is a desired goal. Today, international collaborations aiming at reducing disaster risks and resilience to disasters are encouraged. The United Nations is one of the leading actors in these incentives. The years 1990-2000 were declared as the International Decade for Natural Disaster Reduction (IDNDR). In 1994, the International Yokohama Conference and the World Conference on Natural Disasters were held. New strategies and principles were identified, and the Yokohama Strategy and Plan of Action for a Safer World was developed to implement them. For encourage these decisions by the countries, the International Strategy for Disaster

Reduction (ISDR) unit was established within the United Nations. In 2000, the Millennium Development Goals (MDGs) were declared and completed as of 2015. Increasing international cooperation to reduce the number and effects of disasters were included in these targets.



Figure 9. Millenium Development Goals

Source: (United Nations 2000)

In 2004, OECD's Large-Scale Disasters, Lessons Learned report and United Nations Development Program (UNDP)'s Reducing Disaster Risk – A Challenge for Development report was published. In the same year, the Yokohama Strategy and Plan was reassessed. In 2005, an international conference (World Conference on Disaster Reduction) was held in Japan, Kobe. This conference was the foundation for the Hyogo Framework for Action (HFA). As a result, the years 2005-2015 were declared as the new Decade of Natural Disaster Risk Reduction. HFA was built on three strategic goals and five action priorities.

Table 8. Strategic Goals and Action Priorities of HFA

Source: (Hyogo Framework for Action Report 2005)

Strategic Goals	
Goal 1	The more effective integration of disaster risk considerations into sustainable development policies, planning and programming at all levels, with a special emphasis on disaster prevention, mitigation, preparedness, and vulnerability reduction.
Goal 2	The development and strengthening of institutions, mechanisms, and capacities at all levels, in particular at the community level, that can systematically contribute to building resilience to hazards.
Goal 3	The systematic incorporation of risk reduction approaches into the design and implementation of emergency preparedness, response, and recovery programs in the reconstruction of affected communities.
Priorities For Actions	
Priority 1	Ensure disaster risk is a national and local priority with a focus on implementation
Priority 2	Identify, assess, and monitor risks and enhance early warning
Priority 3	Build a culture of safety and resilience at all levels
Priority 4	Reduce the underlying risk factors
Priority 5	Strengthen preparedness for effective response

At the UN Sustainable Development Summit in 2015, the 2030 Agenda for Sustainable Development was adopted. This is continuation of the MDGs. It was also emphasized here that poverty intensifies the effects of disasters. The importance of reducing disaster risks, increasing resilience to disasters, disaster management and international cooperation was highlighted.



Figure 10. Sustainable Development Goals

Source: (United Nations 2015)

In 2015, third UN World Conference held, and the Sendai Framework for Disaster Risk Reduction 2015-2030 was developed. This is a continuation of the HFA. It highlights that the poverty increases the severity of disasters. Increasing international cooperation, developing early warning systems, and preventing losses caused by disasters are the main goals. By identifying priority actions and goals, it was aimed to increase social resilience and to build a disaster risk management model.

Table 9. Sendai Framework for Risk Reduction Priorities and Targets

Source: (Sendai Framework for Disaster Risk Reduction Report 2015)

Strategic Goals	
Goal 1	Understanding disaster risk
Goal 2	Strengthening disaster risk governance to manage disaster risk
Goal 3	Investing in disaster reduction for resilience
Goal 4	Enhancing disaster preparedness for effective response, and to “Build Back Better” in recovery rehabilitation and reconstruction
Priorities For Actions	
Priority 1	Prepare, review, and periodically update disaster preparedness and contingency policies, plans and programs, ensuring the participation of all sectors and stakeholders
Priority 2	Promote regular disaster preparedness, response, and recovery exercises
Priority 3	Develop and strengthen, as appropriate, coordinated regional approaches and operational mechanisms to prepare for and ensure rapid and effective disaster response

In 2020, UNDRR prepared "Hazard Definition and Classification Review Technical Report". And studies in this framework are continuing. Not only by UN, especially in countries, which under the high earthquake risk, studies and encourages are carried out in a multi-disciplinary and intensive manner. These are for understand the earthquake issue, research the earthquake or triggered disasters caused damages and losses and develop methods to reduce them. In developed countries at high risk, these studies became priority in terms of planning and governance and put into practice. According to the results, annual plans are made, necessary laws are enacted, and organization is started.

3.2.1. Japan

The geographical location, geological structure and climate of Japan make it vulnerable to natural disasters. "In the 1960s to 1980s, urban development progressed, and residential areas in particular were developed on hills in the vicinity of major cities because of rapid economic growth, thus increasing the number of disaster-prone areas" (ADPC 2005, 34). However, earthquake in Kobe in 1995 was the breaking point for the country. The capital of Hyogo, Kobe, damaged most. The initial response was very slow, infrastructural systems such as traffic, communication etc. were destroyed. "A cabinet information collection centre was established by national government. At the same time, it appointed a Minister of State for Disaster Management and Chief cabinet secretary for Crisis Management. The government developed a disaster information system, which consists of an Early Estimation System and an Emergency Measures Support System. The Japan Meteorological Agency (JMA) and local governments developed seismic intensity observation points with seismographs." (ADPC 2005, 50). Also, studies at international scale started after the disaster. Today, effective implementation of the disaster management system of the country eliminates the negative consequences of disaster events and is perceived as a part of daily life for Japan. Thus, Japan is among the most successful countries in this regard.

The authority responsible for the organization and coordination mechanism for natural disasters in Japan is the Disaster Prevention Council (DPC) within the National Land Agency (NLA) (Adıgüzel 2019, 215). This office is responsible for determining and planning preventive or mitigating policies for any disaster that may occur in Japan, and for the implementation of this law against large-scale earthquake disasters within the framework of the Basic Law on Measures Against Natural Disasters (Akdağ 2002, 16).

The Basic Law on Measures Against Disasters entered into force in 1961 and took its final form in 1997 (Yavaş 2005). It includes definition of legal authorities, disaster management responsibilities, disaster preparedness, execution of disaster emergency aid and recovery, financial measures, and emergency announcements. Then, in 2001, "the Sediment-Related Disaster Prevention Act was enacted. In 2002, 44% of all municipalities which have sediment-related disaster-prone sites had made their hazard maps public" (ADPC 2005, 34). The aim was to improve construction conditions, restrict

new construction, evacuate settlements in risky areas, raise awareness, improve cooperation between emergency response teams and develop early warning systems. People were informed and hazard maps were shared with the public via the internet and mail. Since 2001, it is the responsibility of the municipalities to educate the public about natural disasters. Each city municipality, considering the possible natural disasters (earthquake, flood, tsunami, landslide, typhoon, etc.) in that city, distributes educational brochures to the public, organizes first aid courses, and establishes aid teams consisting of volunteers for each district. In addition, every year on September 1, disaster drills are organized with the participation of all relevant organizations (such as the Police, Fire Brigade, Rescue and Medical Assistance Team, Electricity Administration, Communication Companies, Red Cross), all the people of the city and volunteer aid teams.

In accordance with laws, organizations established in three different contexts: at the national, state, and municipal level. At the national level, a Central Disaster Prevention Council was established under the Prime Minister, consisting of all ministers and the Heads of the Bank of Japan (BOJ), the Japan Radio and Television Corporation (NHK), the Japan Telephone and Communications Corporation (NTT), and the Red Cross (ICRC). The main task of this council is to create and implement the “Disaster Prevention Basic Plan” (Akdağ 2002).

The Basic Plan is the document that determines which institution will do what from the first minute in the event of a natural disaster, how inter-institutional coordination will be ensured, and what measures will be taken during and after the disaster. The Council convenes once a year.

Main lesson, which should be taken from Japan in terms of disaster risk management, is that a disaster is not always predictable but suitable information and effective logistic can minimize the negative impact of the disaster and enable rapid intervention. “Accurate information is an absolutely key factor for the response” (ADPC 2005, 51). These must be done quickly especially at high-risk countries or regions:

- Creation of hazard maps,
- Determination or restriction of construction conditions according to these maps,
- Framing these conditions or restrictions by law,

- Rising awareness,
- Revision of the maps, keeping information, plans, policies, regulations current,
- Development of collaborative, sustainable and applicable methods,
- Identification of responsible organizations and review of these methods, information, plans, etc. sharing.

3.2.2. United States of America

Federal Emergency Management Administration (FEMA) in USA is the counterpart of DPC (Disaster Prevention Council) in Japan. It was established in 1979. It is a highly effective organization, independent from the US Federal Government. President of it is appointed by the President of the USA and confirmed by the US Senate. Coordinating the disaster relief activities on behalf of the President of the USA, is the responsibility of appointed president (Yavaş 2005). "FEMA's mission is helping people before, during and after disasters, and the core values and goals help achieve it" (FEMA 2023). For this, like its counterpart institutions, it strives to develop comprehensive, risk priority programs that include all phases of risk management. The studies of it includes establishing building standards, teaching the public how to deal with disasters, assisting local governments and the centre with emergency preparedness, coordinating federal disaster response, outsourcing government, and community disaster relief. Establishing disaster-resilient areas and preparing for rapid and effective recovery and development in the event of a disaster forms the basis of FEMA's most important response structure.

Also, in 1992, the Emergency Supply Management System (SUMA) developed with cooperative and participatory approach and began operations in Latin America (ADPC 2005, 36). It aims to administrate and coordinate of information of disaster affected region. It is a kind of technical tool and operational indicator. Determination and categorization of the aids, determination of need-based supply, coordination the teams, preparation of reports are the functional examples of SUMA. It is a method for emergency logistic system.

In the USA, which has an effective and socially strong aid structure for disasters, disaster relief programs are in two categories as aids to individuals and to the public. For individuals, housing or emergency repair funds are provided using local resources for people whose have destroyed or damaged housing caused by disaster. But this is valid for insured houses. For not insured houses, low-interest loans are provided. However, if exposed people cannot afford the debts, donations are made. For public, subsidies are made to states or local entities as part of the cost of rebuilding damaged infrastructure. Removal of debris, repair and reconstruction of damaged public buildings are included in public assistance programs (Akdağ 2002, 15).

Same as Japan, USA has a system for suitable information and emergency logistic in terms of disaster risk management. Institutional background, coordination, technical tools, and operational indicators seems like key factor.

3.2.3. Canada

In Canada, Emergency Situations Act came into force in 1988 and replaced the War Measures Act (Akdağ 2002, 18). It regulates to coordinating and supporting the implementation of the plans in the natural disaster moment, ensuring cooperation between federal and state governments, raising public awareness, training programs for civil defence personnel regulates the issues of giving. On the other hand, Canadian Civil Defence Act authorizes the federal government to distribute financial aid to affected provinces and territories. That financial aid is regulated through the Disaster Financial Assistance Arrangements (DFAA). It is received if the disaster damage places an excessive burden on the economy of the state or region. Its level is determined by the size and population of the province.

The government developed Canada's National Disaster Mitigation Strategy (NDMS) report in 2008. The aim is "protecting lives and maintain resilient, sustainable communities by fostering disaster risk reduction as a way of life" (NDMS 2008). Then, Canada's Platform for Disaster Risk Reduction was established in 2009. It is "a multi-stakeholder national mechanism that coordinates and advises on areas of priority requiring concerted action" (Public Safety Canada 2023). On the other hand, Emergency Preparedness Canada (EPC) within the Ministry of National Defence is the basic unit

responsible for ensuring that the public is prepared against natural disasters that may occur (Uzunçibuk 2005).

In Canada, emergency implementations are made by "stratification model". It is an operational method with layers. The first layer is the community affected by the disaster helping each other. The second layer is interfering with the local and state level. Local government provides support to the local community if measures against disasters cannot take by their own means. The responsibility of managing a disaster belongs to local governments, in general. Disaster events such as a war, affecting a large part of the country, are exception. Such kind of case, the federal government takes responsibility directly (Yavaş 2005). And as a conclusion, the emphasis on legal, institutional, and operational background comes to the fore in Canada, in terms of disaster risk management.

3.2.4. Italy

Civil protection is a crucial function for Italy. In 1992, Italian National Civil Protection Service was established by Law no. 225 and reformed in 2018 by the Civil Protection Code (European Commission 2022). It creates civil protection policies for the Prime Minister or on behalf of the Interior Minister, and to coordinate and encourage the activities of other units of the National Civil Protection Service. The aim is protecting lives, properties, and environment in the country from damage caused by natural and technological disasters or other harmful events.

The first civil protection authority is the mayor. In an emergency within the municipality's jurisdiction, responsibility for the management and coordination of rescue activities and is responsible for assisting the affected population belongs to the mayor. Support from higher units may be requested. However, a national level initiative can also be provided due to the coordination, intensity, and magnitude of the incident, when emergency measures and intervention with the help of emergency forces are necessary. In such kind of case, Chairman of the Council of Ministers has the authority to declare an emergency (Yavaş 2005, 117; Arkıç 2012).

3.2.5. France

Ministry of Interior of France is the major actor of all disaster management organization. It has responsibility to all relevant laws and rules preparation. In 1975, General Directorate of Internal Security was established and restructured in 1991. This institution has three main tasks for prevent natural risks, protect lives and properties. First one is cooperation with other public institutions and organizations. Second one is coordination and initiation of search and rescue efforts. And third one is renewing, reviewing, and regulating of legislation related to disaster services (Akdağ 2002). "Directorate-General for Civil Protection and Crisis Management (DGSCGC), within the Ministry of Interior, has responsibility for anticipating and monitoring crises affecting internal and civil security. It contributes to intermenstrual planning for national security and monitors national operational activity through its operational centre (COGIC). It has national resources to support local rescue operations (airborne resources, armed civil security forces, deminers). It ensures the management of civil security and major crises entrusted to the minister of the Interior by implementing an "inter-ministerial crisis cell" (CIC)" (European Commission 2022).

In France, there is an important idea that disaster management success will increase with the active participation of volunteers. Educating and motivating the society against disasters is one of the primary steps of disaster management. At the same time, television and radio channels are obliged to broadcast on topics such as first aid, civil defence, and organization.

When looking at the disaster management models of developed countries in general, many common points are seen. Disaster management is an interdisciplinary phenomenon, and each country gives that importance. Not only after disaster, but also before and during disaster interventions are considered collectively in all phases of the management system. Legal, institutional, organizational, and operational background, actors (local government, state, volunteers, public, non-governmental organizations etc.) has crucial role in the disaster management cycle. Main responsibility of create, management and support of the disaster management system is on a single institution, however there is a great coordination and cooperation with other institutions and

organizations. There is a main national strategy of each country, which determines the main issues to be done and those responsible for disasters.

3.2.6. Turkey

Turkey ranks high in the world in terms of losses (lives, property, economic etc.) and destructions due to disasters (Turkey Country Report 2019). As mentioned in other countries, interdisciplinary characteristic of disaster management is valid for Turkey too. However, institutional frame is more complex than other countries. In general term, it has two branches regarding to disasters: national and international.

Table 10. Disaster Institutions in Turkey

Source: (Doğan 2019)

INSTITUTIONS REGARDING TO DISASTERS	
National	AFAD
	Disaster and Emergency High Council
	Disaster and Emergency Coordination Committee
	Provincial Organizations
	KIZILAY
	Disaster Risk Reduction Platform
	Non-governmental Organizations
International	UN System (UNDP, UNOCHA, UNICEF, WFP, WHO)
	Non-governmental Organizations
	USIAD
	NATO
	Financial Institutions (WB, IMF)

Disaster and Emergency Management Presidency (AFAD) seems like the major actor. It was established in 2009 with law no 5902, within the Prime Ministry. Its aims are re-establishing of understanding and organization of disaster management, carrying out

services related to disasters, emergencies, and civil defence, ensuring coordination between the institutions and organizations before the disaster and to establish policies. Its main tasks are taking measures for effective services related to disasters, emergencies, and civil defence, ensuring disaster preparedness and mitigation, coordinating, developing policies and strategies. And there are eight sub-units within: Department of Information Systems and Communications, Department of Earthquake, Department of Improvement, Department of Intervention, Planning and Mitigation Department, Civil Defence Department, Strategy Development Department, Department of Management Services. On the other hand, there is also Disaster and Emergency Coordination Committee (Afet ve Acil Durum Koordinasyon Kurulu), which established for the purpose of ensuring preparedness and mitigation, determining measures, ensuring, and supervising the implementation of these measures, coordinating. However, the responsibility for approving the plans, programs and reports prepared for disasters and emergencies belongs to Disaster and Emergency High Council (Afet ve Acil Durum Yüksek Kurulu).

In addition, Disaster Risk Reduction Platform established in 2011. Its aims are raising awareness of public, ensuring sustainability in disaster risk reduction, monitoring practices, and contributing evaluation, ensuring risk reduction principle in plans, policies, and programs at all levels. Also, Turkish Red Crescent (Kızılay) has responsibility, especially in crisis management. It gives services for providing the needs of exposed (such as water, shelter, food etc.). And there are some non-governmental organizations such as Search and Rescue Association (AKUT), Civil Society Disaster Platform (SİTAP).

Complexity of institutional and organizational network regarding to disasters in Turkey is clear. The descriptions, missions, visions, and objectives are not clearly differentiated from each other. Therefore, it is not possible to achieve success in carrying out disaster risk management processes, taking precautions, developing plans, policies and strategies, their sustainability and hierarchical consistency. This is most striking situation that occurs in Turkey compared to other countries and poses an obstacle to the disaster risk management process. Thus, legal, and institutional background of earthquake risk management will examine detailly in Chapter 4.

CHAPTER 4

LEGAL AND INSTITUTIONAL BACKGROUND OF EARTHQUAKE RISK MANAGEMENT IN TURKEY

As mentioned in Chapter 2 before, earthquakes recorded with instrumental measurements since 1900 are called "instrumental period earthquakes" (AFAD 2014, 38). There are only observational data on earthquakes before this period. Therefore, studies on earthquakes that occurred after 1900s yield more reliable and meaningful results. Thus, this thesis considers the instrumental period a milestone.

Also, in the first quarter of the 1900s, an important regime change occurred in Turkey. With the proclamation of the Republic, changes occurred in the legal and administrative processes. For these reasons, in this thesis, the legal and institutional background of earthquake risk management in Turkey, in the content of spatial planning, has been examined since the first quarter of the 1900s.

Tekeli (1998) categorized the spatial planning of Turkey in the republican period as 1923- 1945 the period from the establishment of the republic to the Second World War, 1945-1960 the period from the Second World War to the military intervention, planned period between 1960-1980, the post-1980 period of globalization. And 1999 Marmara earthquake is accepted as a breaking point for Turkey in terms of earthquake. In addition, Kahramanmaraş earthquake on February 6, 2023, which occurred during the writing of this thesis and is described as the most destructive earthquake in the history of the republic, is second breaking point. Based on these, in this study, the republican period legal and institutional background of earthquake risk management in Turkey is categorized according six breaking points.

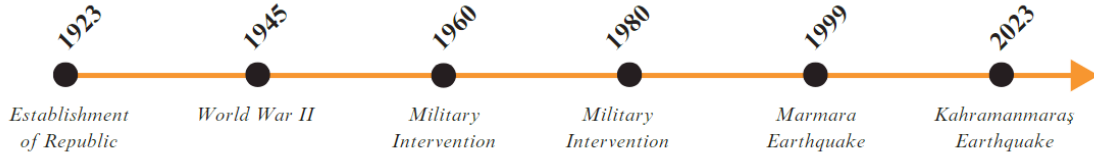


Figure 11. Categorization of Republican Period Earthquake Risk Management in Spatial Planning of Turkey

4.1. 1923-1945 Period

In this period, there were developments on planning rather than on disaster issues. Main dynamics guiding spatial development in the world at the period were development of Fordism and mass production by Henry Ford in 1910, becoming progress as main aim of modern society (Kaya 2002, 54), ending of World War I in 1918, starting of Great Depression in 1929 and World War II in 1939 and their continuing effects. Some concrete developments in the urban spaces as a result of these dynamics occurred. Production efficiency and new market searching increased. Technological inventions changed the cities especially about communication and transportation. Modern professions, like urban planning, occurred as a distinct discipline. Especially after the Great Depression, unemployment increased, role of the state changed (disadvantaged protection based), planning used as a tool for social class regulation (Kaya 2002).

Planning was a “Bureaucratic Profession”, an instrument of change and social action in urban and rural areas and institutionalized as a form of state intervention (Kaya 2002, 54). Planners were experts responsible to technical rationality in decision making process and public interest (Beauregard 1996). New approaches were developed in the context of "Functionalist Approach" (such as city functional movement and comprehensive planning), planning theory was incorporated to "Chicago School of Sociology and Human Ecology" in 1918-1939 and contemporary urban theories and models were evolved (Concentric Zone Theory by Burgess (1925), Location Theory by Lösch (1929), Law of Retail Gravitation by Reilly (1931), Central Place Theory by Christaller (1933), Sector Theory by Hoyt (1939), Multiple Nuclei Theory by Harris and

Ulman (1945)) (Kaya 2002). And the disaster perception shifted from an act of nature to act of nature-human interplay (Chaudhary and Piracha 2021).

Main dynamics guiding spatial development in Turkey at that period, were successfully emergence from the National Independence War, proclamation the Republic October 29, 1923, and new “Constitution” coming into force on April 20, 1924. Because of these dynamics, abandoning of İstanbul, declaration of Ankara as capital, losing population of İstanbul and the western part of the country, rebuilding of the capital city, renovation of post-disaster cities (especially after war and fires) experienced as concrete developments in the urban spaces. Also, with development of modernity project (holistic modernization) transformation from traditional society to modern society and modern city image were aimed. Railway-based infrastructure investment strategies adopted. Economy stagnated; new policies were produced. National bourgeoisie class, culture and lifestyle was created. The squatter (gecekondu) appeared (Tekeli 1998).

General situation in Turkey in terms of planning perspective and effort glowed up. Planning was an instrument to achieve the goals of the modern nation. And urban planning activities were spread overall the nation. Steps were taken for the institutionalization of the planning and planning education. Urban and regional planning studies were carried out. In addition, legal and institutional ground of planning, aim and importance of these changes and developments mentioned in Table 11.

Table 11. Legal and Institutional Background of Earthquake Risk Management between 1923-1945

1923-1945 PERIOD from Proclamation of Republic to World War II															
DEFINITION OF THE PERIOD				LEGAL-INSTITUTIONAL FRAMEWORK OF PLANNING & EARTHQUAKE											
WORLD				TURKEY				WORLD				TURKEY			
Main Dynamics Guiding Spatial Development	Concrete Developments in the Urban Spaces	Main Discussion Fields Influencing Planning	Planning Perspective and Efforts	Main Dynamics Guiding Spatial Development	Concrete Developments in the Urban Spaces	Main Discussion Fields Influencing Planning	Planning Perspective and Efforts	⁴ Legal and Institutional Ground in Planning	Disaster that Affected Deeply	Legal and Institutional Ground in Planning ⁵	Aim and Importance of These Changes and Developments				
Fordism Modernism Progress of society 1914-1918: World War I 1929: Great Depression 1939-1945: World War II	Production efficiency New markets Technological interventions Planners-as separate profession Welfare state	Mass production Uniform - Standard Modernist space design principles Zoning concept Regional planning Functionalist approach	Planning as: “Bureaucratic Profession”, instrument of change and social action, a form of state intervention Planners as experts ⁶ 1928- 1970: CIAM principles Contemporary urban theories and models ⁷ Disaster perception: from an act of nature to nature-human interplay	National Independence War ⁸ “Treaty of Lausanne” was signed. 1923: Turkey Republic 1924: New constitution	Building of the Modernist Nation-state Ankara as a new capital city Decreasing population in İstanbul & Izmir Destruction caused by disasters (massive incendiaries in Izmir) Railway-based infrastructures Integration to the world economy National bourgeoisie class, culture, lifestyle	Zoning concept Municipal socialism Village plans Regional plans: -Regions affected by the big incendiaries -Zonguldak	Planning as a way of constitution of the modern nation Planning education & institutionalization of the planning Planning spread overall the nation	1914: The first professional institute ‘Town Planning Institute (TPI)’ in England 1916: ‘Planning Comprehensive Zoning Ordinance’, NY 1917: ‘American Institute of Planning’ (AIP) 1919: International Federation of Red Cross and Red Crescent Societies (IFRC) 1922: ‘Standard State Zoning Enabling Act’ in USA 1923: ‘Regional Planning Association of America’ (RPAA) 1932: ‘Urban and Rural Planning Law’ in England.	1930- Turkish Iranian border (Hakkari) Earthquake 1939-Erzincan Earthquake 1942-Erbaa (Tokat) Earthquake 1943-Ladik (Samsun) Earthquake 1944-Gerede (Bolu) Earthquake	1923- Establishment of the “Ministry of Development and Housing” (<i>Mübadele, İmar İskân Bakanlığı</i>) 1925- Building Act (<i>Revision of 642 sayılı Ebniye Kanunu</i>) 1928- Municipal Law No. 1580 1930- Municipal Law No. 1590 1930- Public Health Law (<i>UmumiHıfzısıhha</i>) 1933- Municipality Building and Roads Law No. 2290 1933- Establishment of Municipalities Bank (<i>Belediyeler Bankası</i>) (with law no:2301) 1934- Municipal Expropriation (<i>Belediyeler İstimlak</i>) Law No. 2722 1936- Decision of the Ministry Assembly No. 29 on the Specification and General Instruction for the Acquisition of As-is Maps of Cities and Towns 1940- Expropriation law for the city to be established after the Erzincan Earthquake No. 3908 1940- Law on the Buildings to be Built for the Damaged in Erzincan and in the Areas Affected by the Erzincan Earthquake No. 3773 ⁹ 1944- Law on Measures to be Taken Before and After Earthquakes No. 4623	Urban planning became mandatory. Preparing master plans, supervising, and building houses for disadvantages was duty of municipality. Municipalities were authorized to renew the fireplaces. Municipalities were responsible to the public health and social aid services. Engineers and architects were responsible to the preparation of the maps. A new form of planning and planner was defined. Expertise of architects and engineers, rather than cartographers, was utilized in the preparation of spatial plans and related competitions. These were the first laws directly related to earthquakes. Providing in-kind and cash aid to those whose houses were destroyed is bound by the rules. First time, the central government took charges before the earthquake. Measures such as determination of earthquake zones and the need for new buildings, making necessary ground surveys , preparation of aid and rescue programs have been implemented				

⁴ Kaya 2002, 55

⁵ Erkan 2010; Övgün 2010; Arkış 2012; Presidency of the Turkey Republic, “Mevzuat Bilgi Sistemi”

⁶ “Cities were separated four basic functions as working, dwelling, recreation, circulation, the official bureaucratic planning environment was defended” (Kaya 2002, 57)

⁷ Chaudhary and Piracha 2021

⁸ Tekeli 1998

⁹ Appendix 1

4.2. 1945-1960 Period

Main dynamics guiding spatial development in the world at that period were finishing World War II, changing state concept (welfare state, democratic and respectful to the human rights), Bretton Woods Agreement in 1945 (converting currency (dollar) into gold), adopting liberal economic policies (development approach, free economy (laissez-faire), and substitute economy for importing countries), dropping atomic bomb in 1945, starting Cold War in 1947. Thus, new improvements occurred in health conditions (DDT, malaria vaccine, etc.), Charter of Athens published in 1954 (delayed because of war), cities overflowed their borders, population increased, transportation systems improved, private vehicle ownership increased (Kaya 2002; Tekeli 1998).

Contemporary urban theories developed, and urban models evolved by Chicago School (such as Rank Size Rule by Zipf (1949), Social Area Analysis by Bell (1959), Shevky and Williams (1949)), theoretical approaches were adopted to planning (such as City Functional Movement, Empirical Studies in Planning, Scientific Method in Planning, Comprehensive Planning, Systems Approach, Rational Comprehensive Planning) (Kaya 2002). Emphasis of cities shifted from pure aesthetic to functionality and efficiency. Service provision especially in terms of health, accommodation and transportation problems' solution became a priority. Planning was perceived as an interdisciplinary profession, with architects, engineers, housing professionals, and experts in social, political, and legal matters. State planning agencies were established for preparing comprehensive development plans and policy plans at national level. There were opinions that national planning would end the effects of great depression and ensure economic stability (Kaya 2002; Tekeli 1998).

Main dynamics guiding spatial development in Turkey at that period, were reflection of Great Depression effects, changing state concept, transition from a single-party system to a multi-party system in 1945, adopting populist policy without abandoning modernity, becoming a member of IMF in 1947 and NATO in 1951, receiving Marshall aids in 1948, and 1958 crisis (Kaya 2002, 105). With this crisis foreign debt increased as a result of liberalization policy. And some concrete developments in the urban spaces because of these dynamics were investment strategies shifting from railway-based infrastructure to highway-based, change on modernity project from radical to

populist, mechanization in agriculture, migrations to urban centers (from rural areas), increasing urbanization rate, integration problems of immigrants into urban life. Also, demand of housing and new infrastructures increased. However, there were technical and fiscal inabilities of both central government and local bodies. Thus, squatter areas in city centers and large-scale informal settlements on the periphery increased, minibuses (dolmuş) as new modes of transportation developed. Squatters became an individual housing presentation form. A dual city structure occurred (evolving in accordance with modernity, spontaneously developing) (Tekeli 1998).

Need of planned development and plans arose. The perspective on planning has changed – not an extension of architecture, but a multidisciplinary social science. Charles Abraham's report about housing problem-solution requires 'impert' came from within, not 'expert' from outside (Kaya 2002, 137). Regulations was done for planning implementations (e.g., Buildings and Roads Act in 1933). In addition, legal and institutional ground of planning, aim and importance of these changes and developments mentioned in Table 12.

Table 12. Legal and Institutional Background of Earthquake Risk Management between 1945-1960

1945-1960 PERIOD from World War II to Military Intervention											
DEFINITION OF THE PERIOD								LEGAL-INSTITUTIONAL FRAMEWORK OF PLANNING & EARTHQUAKE			
WORLD				TURKEY				WORLD		TURKEY	
Main Dynamics Guiding Spatial Development	Concrete Developments in the Urban Spaces	Main Discussion Fields Influencing Planning	Planning Perspective and Efforts	Main Dynamics Guiding Spatial Development ¹⁰	Concrete Developments in the Urban Spaces	Main Discussion Fields Influencing Planning	Planning Perspective and Efforts	Legal and Institutional Ground in Planning ¹¹	Disaster that Affected Deeply	Legal and Institutional Ground in Planning ¹²	Aim and Importance of These Changes and Developments
1939-1945: World War II Changed state concept (welfare state, democratic and respectful to the human rights) 1945- Bretton Woods Agreement Liberal economic policies: -Development approach -Free Economy (laissez-faire) policies -Substitute economy for developments in importing countries 1947- Cold War	New improvements in health conditions (DDT, malaria vaccine, etc.). 1954- Charter of Athens Rapid urbanization -transportation systems improvements -private vehicle ownership increasing	Welfare state Functional city movements Scientific methods in planning RCP approach Industrial districts Mass housing sites National planning	Contemporary urban theories & urban models from Chicago School New theoretical planning approaches Cities' emphasis from pure aesthetic to functionality & efficiency Prioritization of health, transportation, accommodation problems & provision of services Planning as an interdisciplinary profession State planning agencies: -comprehensive development plans -policy plans	Great Depression's effects Changed state concept 1945-From single-party to multi-party system Populist policy without abandoning modernity 1947- IMF membership 1948-Marshall aid 1951- NATO membership 1958 Crisis-foreign debt because of liberalization policy	Modernity project changed - from radical to populist Shifted infrastructure investment strategies (from railway to highway-based) Mechanization in agriculture Increased migration to urban centers Increased urbanization rate Immigrants' integrating problems Governments' inabilities- increased housing & infrastructure demand Squatters- as individual housing presentation form New modes of transportation- <i>dolmuş</i> Dual city structure	Rapid urbanization Liberalization Migration Rational comprehensive planning Housing supply Dwelling problem Apartments	Need for planned development & plans Planning paradigm shifted- from physical planning to comprehensive rationalist planning Planning perspective- from architecture's extension to multi-disciplinary social science C. Abraham's report about housing problem- 'impert', not 'expert' First foundations for planning education Regulations about planning implementations	1945- United Nations Conference on International Organization (UNCIO) 1945- UN establishment 1945- IMF establishment 1945- World Bank (WB) establishment 1945- UNESCO establishment 1946- UNICEF establishment 1948- WHO establishment 1949- NATO establishment	1946-Varto-Hınıs (Muş-Erzurum) Earthquake 1949-Karlıova (Bingöl) Earthquake 1953- Yenice (Çanakkale) Earthquake	¹³ 1945- Turkey Earthquake Zones Building Regulation 1945- Establishment of İller Bank (with law no. 4759) 1945- Establishment of Ministry of Public Works ¹⁴ 1947- Earthquake Regulation ¹⁵ 1947- Turkey Earthquake Zones Map revision 1948- Municipal Revenues Law No. 5237 1948- Law on Residences to be Built in Erzincan No. 5243 1953- Law on Encouraging the Construction of Buildings and Buildings Without Permission No. 6188 ¹⁶ 1953- Earthquake Regulation Revision 1953- Earthquake Bureau establishment (under the Ministry of Public Works, Construction and Zoning Affairs Directorate) 1954- Law on Union of Chambers of Turkish Engineers and Architects and establishment of TMMOB 1955- I. Redevelopment Congress (<i>İmar</i>) Congress 1956- Planning Law No. 6785 (<i>İmar Yasası</i>) 1958-Establishment of the Ministry of Development and Housing (with law no. 7116) (<i>İmar İskân Bakanlığı</i>) 1958- Civil Defense Law No. 7126 1959- Disaster Law ⁴ 7269	Turkey Earthquake Zones Map was created. Municipalities were authorized to build mass, cheap and simple houses and to distribute these to squatter owners. It aimed carrying out studies on minimizing disaster damage . In 1955, with transformation into DE-SE-YA ¹⁷ branch, its disaster coverage was expanded. First time, new settlements determinate, considering natural hazards & providing building control were prioritized. Disaster-related duties ¹⁸ determined. Search-rescue & first-aid principles, organization, duties, responsibilities of civil defense in emergencies were determined. All disaster laws were combined into a single law . "Disaster Fund" created.

¹⁰ Kaya 2002, 104-105

¹¹ United Nations, "History of the United Nations"

¹² Erkan 2010; Övgün 2010; Arkiş 2012; Presidency of the Turkey Republic, "Mevzuat Bilgi Sistemi"

¹³ Appendix 2

¹⁴ Ministry of Public Works, Head of Zoning Affairs, Urbanism Science Committee (Bayındırlık Bakanlığı İmar İşleri Reisliği Şehircilik Fen Heyeti)

¹⁵ Appendix 3

¹⁶ Appendix 4

¹⁷ DE-SE-YA (Deprem-Seylak-Yangın) (Earthquake, Flood, Fire)

¹⁸ Duties were taken over from the Ministry of Public Works: to take pre-disaster and post-disaster measures, to make national planning, to solve the housing problem.

4.3. 1960-1980 Period

Criticism of both welfare-state and development approach, Oil Crisis between 1974-1979, changing mode of production (from Fordist to post-Fordist), increasing global diversification, changing state role, decreasing central government authority, prioritization of "private" were the main dynamics guiding spatial development in the world at that period. Some concrete developments in the urban spaces as a result of these dynamics occurred. Profits based mass production and mass consumption decreased. Development approach caused; environmental pollution, historical, cultural values' destruction, rapid urbanization, deteriorating and unhealthy living conditions, economic instability (inflation, poverty, unemployment etc.). Information technologies developed (personal computer ownership increased, data access and used improved) (Kaya 2002).

Also, planning paradigm shifted in terms of cultural, epistemological, plan document and spatial arrangements: from modernism to postmodernism, from absolute rationality to communicative rationality, from master plan to structure plan, from physical design to behavioural design (Kaya 2002, 73). "Comprehensive and rational comprehensive planning approaches criticized. More participatory and pragmatic planning approaches adopted such as incremental planning, mixed scanning, implementation-oriented planning, strategic planning, advocacy planning, equity planning, democratic planning" (Kaya 2002, 67-68). Contemporary urban theories and urban models evolved from Chicago School. Urban systems' models developed in 1960s-70s based on systems approach. Successive limited comparisons method developed. Information on the types of assistance they can offer in natural disasters was requested from member states by UN, in 1965 (United Nations n.d.). Recommendations to assistance in cases of natural disaster determined by UN, in 1970.

1960 is an important breaking point for Turkey. There was a military intervention in that year and new constitution came into force in 1961. Leftist thought for the first time in a political sense were occurred. Local elections were carried out in 1973. Student movements happened in 1968. Automobile production started. Thus, migration (especially to Germany) of labour force, problems caused by urbanization increased, Izmir and Ankara became metropolitan like İstanbul. Some areas in the CBD were closed to vehicular traffic, reserved for pedestrians, in the second half of the 1970s (Tekeli

1998). Services (for employees) emerged as a new mode of transportation. Industrial activities intensified and moved away from the city centre - with OIZ. Cities exceeded the municipal boundaries, the number of municipalities increased. Upper income groups began to settle in the city periphery, and regional inequalities arose. The New local government movement flourished, between 1973-1977.

Also, planning gained respect in the country and emphasis on social sciences increased. The planned development model was adopted, 5-years development plans were prepared. Planning perspective ceased to physical plan, the necessity of economic and social dimensions was understood. The approach was that the state should meet the housing needs of the low-income. New specializations developed such as urban conservation planning, planning of tourism areas and transportation planning. In 1961, the first planning department was established at METU (Tekeli 1998). Planning competitions were held. New housing presentation formats occurred such as mass housing or cooperative. In addition to these, legal and institutional ground in planning, and aim and importance of these changes and developments mentioned in Table 13 detailly.

Table 13 Legal and Institutional Background of Earthquake Risk Management between 1960-1980

1960-1980 PLANNED DEVELOPMENT PERIOD											
DEFINITION OF THE PERIOD								LEGAL-INSTITUTIONAL FRAMEWORK OF PLANNING & EARTHQUAKE			
WORLD				TURKEY				WORLD		TURKEY	
Main Dynamics Guiding Spatial Development	Concrete Developments in the Urban Spaces	Main Discussion Fields Influencing Planning	Planning Perspective and Efforts	Main Dynamics Guiding Spatial Development ¹⁹	Concrete Developments in the Urban Spaces	Main Discussion Fields Influencing Planning	Planning Perspective and Efforts	Legal and Institutional Ground in Planning	Disaster that Affected Deeply	Legal and Institutional Ground in Planning ²⁰	Aim and Importance of These Changes and Developments
Welfare state & national development approach criticism 1974-1979: Oil Crisis Changed mode of production & role of countries and state Global diversification Central government authority decreased Private sector and actions became top priority	Decreasing of profits-based mass production & mass consumption National developmental approaches and far from adequate Information technologies developed: -PC ownership increased -Data access and used improved	Social movements Civil rights movement Public participation Post-modernism Post-Fordism Flexible production IT technologies Rising Mobility Public-private partnership & Privatization Successive limited comparisons	Planning paradigm shifted Criticism of CP and RCP ²¹ Contemporary urban theories and urban models by Chicago School: - Land Theory by Alonso (1964), -More Integrated Models of Urban Systems by Lowry (1964) -Forester (1969) ¹⁵ Urban systems' models-based on systems approach: - Lowry model (1964), - Forester's model (1969) 1965: UN member states' requests about disasters ²² 1970:Recommendations to assistance in cases of natural disaster by UN	1960: Military intervention 1961: New constitution Leftist thought for the first time in a political sense 1968: Student movements Automobile production started. 1973: Local elections	Migration of labour force Increased problems caused of urbanization Izmir and Ankara as metropolitan Pedestrians became priority in some areas of CBD Services (for employees) as a new mode of transportation Industrial activities intensified & moved away from the city centre - with OIZ. Growth cities & increased municipalities Upper income groups in the city periphery & arose regional inequalities 1973-1977: New local government movement	Welfare state Planned development Rational comprehensive planning Mixed economy policy Industrial districts Traffic issues Regional planning Metropolitan planning New local government movement (<i>yeni belediyeçilik hareketi</i>)	Planning gained respect & emphasis on social sciences increased Planned development model- 5-years development plans Planning perspective- physical to economic & social dimensions New state approach - low-income's housing New specializations: -Urban conservation -Tourism areas & transportation planning 1961: METU planning department & planning competitions New housing presentation formats occurred: -Mass housing -Cooperative	1961- World Food Programme (WFP) establishment 1961- United States Agency for International Development (USIAD) establishment 1965- United Nations Development Program (UNDP) ²³ 1971- United Nations Disaster Relief office (UNDRO) establishment 1978- Technical cooperation activities for regional and interregional scale disaster preparedness and prevention were included in the UN development program. ²⁴ 1979-The new International Development Strategy 1976- HABITAT I 1979- FEMA establishment	1966- Varto (Muş) Earthquake 1970- Gediz (Kütahya) Earthquake 1971- Bingöl Earthquake 1975- Lice (Diyarbakır) Earthquake 1976- Muradiye (Van) Earthquake	1960- State Planning Organization establishment 1961- Earthquake Regulation Revision ²⁵ 1963 - Turkey Earthquake Zones Map revision 1963- Municipal Law No. 307 1965- Metropolitan planning offices in Izmir, Istanbul, and Ankara 1965- Establishment of the General Directorate of Disaster Affairs 1966- Squatter Law No. 775 1968- Law No. 1051 ²⁶ 1968- Regulation on EAO& PPRD 1968- City planners joined TMMOB ²⁷ 1972- Turkey Earthquake Zones Map revision 1972- Law No. 1571 1972- Law no. 1605 1975- Earthquake Regulation Revision 1977- Law on Assistance to Farmers Damaged by Natural Disasters	National 5-year development plans were prepared- focus on metropolitans' problems. Presidential system in municipal administration implemented. They carried out master plan studies in metropolitan areas. On public land usage, for rehabilitation & prevention zones. Law No. 7269 -Format of disaster preparedness & response activities regulated. "Earthquake Fund" account-Central Bank. Law No. 6785 -In the metropolises, ministry was given the authority to plan above the municipalities.

¹⁹ Tekeli, 1998

²⁰ Erkan, *Afet Yönetiminde Risk Azaltma*; Övgün, *Türkiye'de Planlama*; Arkış, *Ülkemizde Yapılan Deprem Master*; Presidency of the Turkey Republic, "Mevzuat Bilgi Sistemi"

²¹ Kaya, 2002

²² Recommendations were pre-disaster planning at the national and international levels, technology and scientific research for prevention and control of natural disasters, international cooperation, development, and improvement of early warning systems.

²³ Strengthening of disaster prevention and pre-disaster planning, in 1974.

²⁴ It considered issues related to disaster relief, preparedness, and prevention.

²⁵ Appendix 4

²⁶ Regulation on Emergency Aid Organization and Planning Principles Regarding Disasters No. 88/12777

²⁷ Appendix 5

4.4. 1980-1999 Period

Cold War and Gulf War ended in 1991. UN determined the years 1990-2000 as International Decade for Natural Disaster Reduction (IDNDR) and European Union (EU) was established in 1993. Some economic crises occurred. Thus, world order changed, global cities idea emerged, Tokyo, London and New York became centres of political, financial, and commercial activity, the number of metropolitan cities increased (Kaya 2002). Conservation, life quality and sustainability notions transformed an international scale.

Cities need density, diversity, and active development idea occurred by Jane Jacobs (Carvalho, 1986, p.106). The gap in the communication of the planners with the public was criticized. Thus, more communication-oriented planning approaches adopted such as transactive planning, negotiative planning, consensus building, collaborative planning (Kaya 2002). The interaction of actors in the planning process was the focus. "Resilience" concept was used for the first time in the field of disaster by Timmerman, in 1981.

The important steps related with legal and institutional background for planning practice were taken, which laid the groundwork for all this. In 1987 Brundtland Report published. It was mostly about sustainability and sustainable development. In 1989, International Framework of Action for the International Decade for Natural Disaster Reduction published. International Day for Natural Disaster Reduction for observation announced October 11, 1989. In 1991, United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) and under UN International Search and Rescue Advisory Group (INSARAG) were established. In 1992, Rio de Janeiro Conference carried out. Then in 1994, I. World Conference on Natural Disaster Reduction in Yokohama, Japan. And Yokohama Strategy and its Plan of Action adopted. HABITAT II carried out in 1996 (United Nations n.d.).

Also, in that period, urban regions were formed, service sector and informal sectors grew, population growth rate decreased, forced migrations increased for security reasons (from Eastern Anatolia), Central Anatolian cities made production directly for the world, CBDs transformed - production activities replaced by the service sector, squatter areas began to benefit from urban rent (Tekeli 1998). Efforts to integrate into the

globalizing world increased regional imbalances. Population and capital were redistributed in space.

Fragmented city occurred, rank-size rules broken, new international actors such as international real-estate property appeared, mass-housing was extended, mass-construction was made in industrial activities (big wholesale sites, free trade zones), campus model in universities were extended, hierarchical integrity of planning was broken, haphazard, fragmented, tourism incentives led to coastalization and secondary housing (Tekeli 1998; Kaya 2002). There were efforts to become a global city for Istanbul. Skyscrapers were made prestigious for the service industry. Housing areas of the population in the high- and middle-income group were built away from the centre. In Istanbul, the rate of illegal and unlicensed buildings in the neighbourhoods where the high-income parts of the city live have taken very high values. Local governments were defined as the main responsible for development and the main administrative units with the regions in the regulation of the management system (Erkan 2010). Urban transformation projects came to the fore with the Laws of the Improvement Development Plan. In addition to these, legal and institutional ground in planning, and aim and importance of these changes and developments mentioned in Table 14 detailly.

Table 14. Legal and Institutional Background of Earthquake Risk Management between 1980-1999

1980-1999 PERIOD from Military Intervention to Marmara Earthquake											
DEFINITION OF THE PERIOD								LEGAL-INSTITUTIONAL FRAMEWORK OF PLANNING & EARTHQUAKE			
WORLD				TURKEY				WORLD		TURKEY	
Main Dynamics that Guide the Spatial Development	Concrete Developments Took Place in the Urban Spaces	Main Fields of Discussion that influence in planning	Planning Perspective and Efforts	Main Dynamics that Guide the Spatial Development ²⁸	Concrete Developments Took Place in the Urban Spaces	Main Fields of Discussion that influence in planning	Planning Perspective and Efforts	Legal and Institutional Ground in Planning ²⁹	Disaster that Affected Deeply	Legal and Institutional Ground in Planning ³⁰	Aim and Importance of These Changes and Developments
1990-2000 International Decade for Natural Disaster Reduction (IDNDR), by UN 1991: Cold War ended 1990-1991: Gulf War 1993: EU Economic crises: -1983, Bank Stock -1987, Black Monday -1992, Black Wednesday -Asian and Russian financial crises	World order changed. Global cities idea ³¹ Tokyo, London & NY as political, financial, commercial centres Conservation, life quality, sustainability notions- at international scale Increasing metropolitan cities	Globalization Post-modernism Flexible production New means of transport and communication Advances in information technologies Sustainability Carbon footprint Critical theory Communicative action	³² Cities' need density, diversity, active development Criticism of communication gap between planners-public Communication -oriented planning approaches Focus: actors' interaction in planning process ³³ "Resilience" concept- for the first time in disaster field	1980: Military intervention & January 24 decisions, 1982: New constitution 1983: General election 1989: GAP Regional Plan Economic crisis: -Banker's crisis,1982 -Gulf crisis, 1991 -1994 crisis Liberalizing economy created globalization trends Redefinition of city-human relationship Capital became dependent on knowledge	Urban regions, sectoral growth (service & informal), decreased population growth rate Globalization efforts & increased regional imbalances Redistribution of population & capital More inter- urban migrations & forced migrations Changes to keep up with globalization: -Development model- from import substitution to outward-oriented export -Investment policies- telecommunications prioritized -Institutionalization - banking reforms, establishment of capital markets, free trade, and production zones Production in Central Anatolian cities directly to the world CBDs transformed Slum areas began to benefit from urban rent	Urban transformation Urban quality Globalization Integration into the world economy Service and informal sectors Mass housing Strategic planning	^{22,25} Fragmented city, new international actors, extension of mass-housing, mass-construction in industrial activities, campus universities, broken hierarchical integrity of planning, tourism incentives- coastalization & secondary housing Efforts for İstanbul-a global Skyscrapers- prestigious for service industry ²⁴ Local governments- main responsibility of development	1987- Brundtland Report 1989- International Framework of Action for the International Decade for Natural Disaster Reduction published. 1989- Second Wednesday of October- International Day for Natural Disaster Reduction for observation 1991- United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) 1991- International Search and Rescue Advisory Group (INSARAG), under UN 1992- Rio de Janeiro Conference 1994- I. World Conference on Natural Disaster Reduction in Yokohama, Japan. Yokohama Strategy and its Plan of Action adopted. 1996- HABITAT II	1983- Erzurum Earthquake 1992- Erzincan Earthquake 1995- Dinar (Afyon) Earthquake 1998- Adana-Ceyhan Earthquake	1981- Law No. 2479 1983- State of Emergency Law No. 2935 1983- Establishment of the Ministry of Public Works and Settlement 1984- Establishment of TOKİ with Mass Housing Law no. 2985 1985- Planning Law No. 3194 1992- Law No. 3838 1995- Law on the Execution of Services Regarding Damage and Destruction Caused by Natural Disasters No 4123 1995- Law No. 4133 ³⁴ 1996- Turkey Earthquake Zones Map revision 1997- Establishment of Prime Ministry Crisis Management Center with Regulation No. 96/8716 1997- Law No. 4264 1998- Earthquake Regulation Revision	Second time, disaster law no.7269 was amended. The disaster was described as a state of emergency. It was decided to declare a state of emergency in cases of natural disasters, epidemics, or severe economic depression. Local administrations were authorized for the preparation and execution of master plans. Aim: compensate for earthquake losses. About the execution of services related to earthquake in Erzincan, Gümüşhane & Tunceli, damage & destruction in Şirnak and Çukurca. A similar law had to be prepared for other regions affected by the disasters that occurred after the Law No. 3838. Basic disaster law no 7269 amended for the third time. It was tasked with doing and directing what is necessary to ensure that the crisis is overcome with the least damage, to provide coordination and cooperation with the relevant ministries, institutions, & organizations. Income, corporate and temporary taxes of those who suffered from natural disasters in some regions were cancelled.

²⁸ Tekeli 1998

²⁹ United Nations, "History of the United Nations"

³⁰ Erkan, *Afet Yönetiminde Risk Azaltma; Övgün, Türkiye'de Planlama; Arkaş, Ülkemizde Yapılan Deprem Master*; Presidency of the Turkey Republic, "Mevzuat Bilgi Sistemi"

³¹ Kaya 2002

³² Carvalho 1986

³³ Timmerman 1981

³⁴ Appendix 6

4.5. After 1999 Period

Main dynamics of the period which effective on urban space, were economic crises, Covid-19 pandemic, Russian-Ukraine War, embargoes, economic tensions, energy (especially natural gas) problems. These changed world orders deeply. The effects are still continued.

In that period, globalization increased rapidly, internet spread around the world, EU borders changed. Due to the pandemic, spatial, social, and economic balances changed. Priority was given to R&D and scientific works. With the economic crises, the city centres became attractive, reversed with the pandemic. Important international guides prepared such as İstanbul program of action in 2011, Sendai framework in 2015 -which includes 15 years-, 2030 Agenda for sustainable development in 2015, New urban agenda determined at HABITAT III in 2016, Johannesburg Plan of Action developed in 2002 and first global assessment report was published in 2009 (United Nations n.d.).

The important legal and institutional background for planning practice, which laid the groundwork for all this, and related to the disasters, is as follows (United Nations n.d.).

- The IDNDR Programme Forum organisation, United Nations International Strategy for Disaster Reduction (UNISDR) development and United Nations Office for Disaster Risk Reduction (UNDRR) establishment in 1999,
- World Summit on Sustainable Development (WSSD), in Johannesburg, South Africa in 2002,
- II. World Conference on Disaster Reduction in Kobe, Japan and Hyogo Declaration and the Hyogo Framework for Action 2005-2015 development in 2005,
- An open Global Platform on Disaster Reduction established for all member states by UN in 2006,
- Rio +20 The Future We Want Conference in 2012,
- Paris Agreement in 2015, and HABITAT III in 2016.

Effects of main dynamics in the world also is occurred in Turkey. Three main economic crises shook to country. These were Black Wednesday Crisis in 2001, Global

Crisis between 2008-2012, Currency and Debt Crisis between 2018-2023. Social, economic, and political changes occurred. Amendments were made to the 1982 Constitution, in 2001, and constitutional amendment referendum took place, in 2007, 2010 and 2017 (Presidency of the Turkey Republic 2020). Turkey tried to keep up with globalization too. Turkey's membership negotiations were started by the European Union (EU) (Ministry of Foreign Affairs of the Turkey Republic n.d.). Thus, governance mechanisms changed, service sector and international sectors grew, regional imbalances increased because of both globalization and crisis, metropolises and their populations increased. Restrictions were imposed on entry into countries because of pandemic and increased immigrants. People were alienated of each other. Immigration problems and brain drains increased. Urban systems remained inadequate due to high migration in metropolitan areas.

In terms of planning perspective and effort, changes took place in the organization of planning, strategic planning approach materialized, planning policies shifted to strategic-based and more flexible. Disaster perspective changed; disaster related works increased. Climate crisis, global warming, dwindling water resources, deeply affective earthquakes as caused that transformation. Immigrant issues moved to the agenda of planning. In 2019, a colloquium with an agenda of Migration-Space-Politics was organized by TMMOB. Real estate preferences changed related to disaster, pandemic, and immigrants both. In addition to these, legal and institutional ground in planning, and aim and importance of these changes and developments mentioned in Table 15 and 16, detailly.

Table 15. Legal and Institutional Background of Earthquake Risk Management after Marmara Earthquake

AFTER 1999 PERIOD from Marmara Earthquake to today												
DEFINITION OF THE PERIOD						LEGAL-INSTITUTIONAL FRAMEWORK OF PLANNING & EARTHQUAKE						
WORLD				TURKEY				WORLD		TURKEY		
<i>Main Dynamics that Guide the Spatial Development</i>	<i>Concrete Developments Took Place in the Urban Spaces</i>	<i>Main Fields of Discussion that influence in planning</i>	<i>Planning Perspective and Efforts</i> ³⁵	<i>Main Dynamics that Guide the Spatial Development</i>	<i>Concrete Developments Took Place in the Urban Spaces</i>	<i>Main Fields of Discussion that influence in planning</i>	<i>Planning Perspective and Efforts</i>	<i>Legal and Institutional Ground in Planning</i> ³⁵	<i>Disaster that Affected Deeply</i>	<i>Legal and Institutional Ground in Planning</i> ^{36,31}	<i>Aim and Importance of These Changes and Developments</i>	
Economic crisis: -Energy crisis, 2003-2009 -Mortgage crisis, 2007-2010 -Automotive industry crisis, 2008-2010 -European sovereign and Greek debt crisis, 2009-2019 2019: Covid-19 epidemic started 2022: Russia -Ukraine War	Rapid globalization -Spreading of internet -Changed EU borders -Changed world orders & balances -Priority to R&D and scientific works -With the economic crises, the city centres became attractive, reversed with the pandemic	Sustainability Pragmatism -Practice movement -Integrative approach -Challenge of global warming -Critics against neoliberalism -Strategic planning -Resiliency -Smart cities -Multi-level governance -Critical pragmatism -Eco regionalism -R&D -Pandemic -Climate change	International guides: -İstanbul program of action, 2011 -Sendai framework, 2015 -2030 Agenda for sustainable development, 2015 -New urban agenda (HABITAT III), 2016 2009: First global assessment report 2002: Johannesburg Plan of Action	³⁷ 2001: 1982 construction amendments ³¹ Constitutional amendment referendum took place, in 2007, 2010 and 2017 Turkey's membership negotiations by the EU -2001 Black Wednesday crisis -Global crisis, 2008-2012 -Currency and dept crisis, 2018-2023	Changed governance mechanisms -Growing service sector & international sectors -Increasing regional imbalances -Increasing metropolises & their populations -Restrictions imposed on entry into countries -Alienation of people -Immigration problems -Brain drains -Inadequate urban systems	Sustainability -Challenge of global warming -R&D -Pandemic -Climate change -Earthquakes -Understanding of Turkey's disaster unpreparedness -Fundamental arrangements on regarding disasters -Immigrant issues -Real estate preferences changed	Strategic planning approach materialized -Changes in the organization of planning -Planning policies shifted to strategic based. -Changes on disaster perspective -Increasing on disaster related works -Immigrant issues moved to the agenda of planning -Real estate preferences changed	1999- The IDNDR Programme Forum 1999- United Nations International Strategy for Disaster Reduction (UNISDR) developed 1999- Establishment of United Nations Office for Disaster Risk Reduction (UNDRR) 2002- World Summit on Sustainable Development (WSSD), in Johannesburg, South Africa 2005- II. World Conference on Disaster Reduction in Kobe, Japan. Hyogo Declaration and the Hyogo Framework for Action 2005-2015 developed 2006- An open Global Platform on Disaster Reduction established for all member states by UN 2012- Rio +20 The Future We Want Conference 2015- Paris Agreement 2016- HABITAT III	1999- Gölcük (Kocaeli) Earthquake 1999- Düzce Earthquake 2011- Van Earthquake 2020- Elazığ Earthquake 2020- İzmir Earthquake 2023-Maraş Earthquake	1999- Law No. 4452 ³⁸ (amended by Laws No. 4434 and 4540) 1999- Decree Laws ³⁹ 2000- Establishment of the General Directorate of Emergency Management of Turkey (<i>Decree No. 600</i>) 2000- Establishment of the National Earthquake Council 2001- Decree Law No. 4708 on Building Control 2004- 5216 Metropolitan Municipality Law 2005- 5302 Special Provincial Administration Law 2005- 5393 Municipal Law 2007- Closure of the National Earthquake Council 2007- Earthquake Regulation Revision 2009- Law No. 5902 ⁴⁰ 2011- State Planning Organisation closed 2011- Decree Law No. 644 ⁴¹ 2012- Catastrophe Insurance Law No. 6305 2012- Transformation of Areas at Disaster Risk Law No: 6306 2013- Law No. 6085 2018- Addition to Law No. 3194 ⁴² 2018- Turkey Earthquake Zones Map revision 2019- Earthquake Regulation Revision	Council of Ministers was authorized for decree laws for a period of ten months: ensuring coordination between relevant institutions, establishment of safe new settlements, a new insurance system, new provinces, and districts in the exposed region. Disaster-related institutions merged. AFAD established. Disaster and Emergency Response Services Regulation Temporary Article 16 added to the Zoning Law No. 3194 (Annex: 11/5/2018-7143/16 art.)	

³⁵ United Nations, "History of the United Nations"

³⁶ Erkan, *Afet Yönetiminde Risk Azaltma*; Övgün, *Türkiye'de Planlama*; Arkiş, *Ülkemizde Yapılan Deprem Master*; Presidency of the Turkey Republic, "Mevzuat Bilgi Sistemi"

³⁷ Presidency of the Turkey Republic, "Mevzuat Bilgi Sistemi"

³⁸ Authorization Law on Measures to be Taken Against Natural Disasters and Arrangements to be Made for Removal of Damages Due to Natural Disasters

³⁹ Detailed in Table 17.

⁴⁰ Law No. 5902 on the Organization and Duties of the Disaster and Emergency Management Presidency

⁴¹ Decree Law No. 644 on the Organization and Duties of the Ministry of Environment and Urbanization

⁴² Appendix 7

Table 16. Decree Laws After Marmara Earthquake

Source: Orhan 2022; Presidency of the Turkey Republic 2020

YEAR	NO	DECREE LAWS
1999	574	Umumî Hayata Müessir Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanunda Değişiklik Yapılması Hakkında Kanun Hükmünde Kararname
	575	Doğal Afet Bölgelerinde Afetten Kaynaklanan Hukukî Uyuşmazlıkların Çözümüne ve Bazı İşlemlerin Kolaylaştırılmasına İlişkin Kanun Hükmünde Kararname
	576	Doğal Afetlerde Yapılacak Yardımların Düzenlenmesi ile Vergilerin Ödeme Sürelerinin Uzatılmasına ve Bazı Kanunlarda Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname
	577	Umumî Hayata Müessir Tabii Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanuna Bir Geçici Madde Eklenmesi Hakkında Kanun Hükmünde Kararname
	578	Bazı Kanunlarda (506, 1479, 2926, ve7269 Sayılı Kanunlar) Değişiklik Yapılması Hakkında Kanun Hükmünde Kararname
	579	Millî Piyango Genel Müdürlüğü Kuruluş ve Görevleri Hakkında KHK'ye Bir Madde Eklenmesine Dair Kanun Hükmünde Kararname
	580	Umumî Hayata Müessir Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanuna Geçici Maddeler Eklenmesi Hakkında Kanun Hükmünde Kararname
	581	Umumî Hayata Müessir Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair 7269 Sayılı Kanun ile Mera Kanunu, Muhasebe-i Umumiye Kanunu, 2886 Sayılı Kanun ile İçişleri Bakanlığı Teşkilât ve Görevleri Hakkında Kanunlarda Değişiklik Yapılması Hakkında Kanun Hükmünde Kararname
	582	Afetten Doğan Zararların Giderilmesi Hakkında Kanun Hükmünde Kararname
	583	Başbakanlık Teşkilatı Hakkında Kanun Hükmünde Kararnamenin Değiştirilerek Kabulü Hakkında Kanunda Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname
	584	Düzce Adı ile Bir İl ve bu ile Bağlı olarak İki İlçe Kurulması ile 190 Sayılı KHK'nin Eki Cetvellerde Değişiklik Yapılması Hakkında Kanun Hükmünde Kararname
	585	İl Özel İdaresi Kanununa Bir Madde Eklenmesi Hakkında Kanun Hükmünde Kararname
	586	Sivil Müdafaa Kanunu ile Belediye Kanunu'nda Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname
	587	Zorunlu Deprem Sigortasına Dair Kanun Hükmünde Kararname
588	Konut Edindirme Yardımı Hesalarının Tasviyesine Dair Kanun Hükmünde Kararname	
2000	589	Emekli Sandığı Kanunu ile Bazı Kanunların Doğal Afetlerle İlgili Maddelerinde Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname
	590	Tapulama ve Kadastro Paftalarının Yenilenmesi Hakkında Kanuna Bazı Maddeler Eklenmesine Dair Kanun Hükmünde Kararname
	591	Ticaret ve Sanayi Odaları, Ticaret Odaları, Sanayi Odaları, Deniz Ticaret Odaları, Ticaret Borsaları ve Türkiye Ticaret, Sanayi, Deniz Ticaret Odaları ve Ticaret Borsaları Birliği Kanununa Bir Geçici Madde Eklenmesi Hakkında Kanun Hükmünde Kararname
	592	Sosyal Sigortalar Kanunu ile 4447 Sayılı Kanun'da Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname
	593	Sakarya İlinde Büyük Şehir Belediyesi Kurulması Hakkında Kanun Hükmünde Kararname
	594	Sosyal Hizmetler ve Çocuk Esirgeme Kurumu Kanununda ve 190 Sayılı Kanun hükmünde Kararname Eki Cetvellerde Değişiklik Yapılması Hakkında Kanun Hükmünde Kararname
	595	Yapı Denetimi Hakkında Kanun Hükmünde Kararname
	596	Sivil Savunma Kanununda Değişiklik Yapılmasına Dair Kanun Hükmünde
	597	Kararname Umumi Hayata Müessir Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanuna Bir Geçici Madde Eklenmesi Hakkında Kanun Hükmünde Kararname
	598	Umumî Hayata Müessir Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanunun Bazı Maddelerinin Değiştirilmesi ile Bir Geçici Madde Eklenmesi Hakkında Kanun Hükmünde Kararname
	599	Umumî Hayata Müessir Afetler Dolayısıyla Alınacak Tedbirlerle Yapılacak Yardımlara Dair Kanunun 3. Maddesinin 3. Fıkrasında Değişiklik Yapılması Hakkında Kanun Hükmünde Kararname
	600	Başbakanlık Teşkilatı Hakkında Kanun Hükmünde Kararnamenin Değiştirilerek Kabulü Hakkında Kanunda Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname ile Türkiye Acil Durum Yönetimi Genel Müdürlüğü kurulması
	601	Mühendislik ve Mimarlık Hakkında Kanun ile Türk Mühendis ve Mimar Odaları Birliği Kanununda Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname
	603	Düzce Adıyla Bir İl ve İki İlçe Kurulması Hakkında (584 Sayılı) Kanun Hükmünde Kararname ile Sakarya İlinde Büyükşehir Belediyesi Kurulması Hakkında (593 Sayılı) Kanun Hükmünde Kararnamede Değişiklik Yapılmasına Dair Kanun Hükmünde Kararname

4.6. Synthesis

In the early 1900s, earthquakes began to be measured with seismographs. This was a milestone for many disciplines, including planning. Thus, after the 1900's was defined geologically as the instrumental period. In 1923, republic proclaimed in Turkey. This was a crucial regime change and bring many developments and change with it. Ministry of Development and Housing was established at the same year. And urban planning became mandatory. However, importance was on planning issues more, rather than disaster issues in that period. Technological inventions changed cities, new form of planning and planners appeared. Planning was used for social class regulation because it was seen as “Bureaucratic Profession” & an instrument for modern nation. Planning activities were institutionalized and spread of the country. There were post-disaster (war and fire) rehabilitation efforts and rebuilding of capital. And there was a significant transformation in the perception of disaster. It shifted from act of nature to nature-human interplay. However, the legal and institutional regulations focus was on post-disaster recovery processes. The laws in 1928 and 1930 came into force for fires, and the law in 1940 came into force for earthquakes. Therefore, during this period, the framework was developed depending on the type of disaster and the region affected by the disaster, until the 1944 law. This law marks the beginning of disaster risk management studies in Turkey.

In 1945, World War II ended, also Turkey switched from single-party system to multi-party system. Same year, Ministry of Public Works was established, and the first earthquake map was created in cooperation with the ministry and the university based on the 1944 law. And first earthquake regulation describing the construction conditions according to the regions on this map came into force in 1947. Same year the map revised, thus the earthquake regulation revised too in 1957. In this period, emphasis of cities shifted from pure aesthetic to functionality and efficiency, service provision and problem solution became priority, planning was perceived as an “interdisciplinary profession” and planning perspective shifted from architecture’s extension to multidisciplinary social science. Thus, first foundations for planning education were laid and first institution regarding earthquake, Earthquake Bureau under the Ministry of Public Works, was established. Its aim was carrying out studies on minimizing disaster damage. And in 1955, its disaster coverage was expanded. Then, with the law in 1956, emphasis was placed on technical liability and building inspection in settlements at risk of natural disasters. This

was first law which determining of new settlements considering natural hazards. In 1958, Ministry of Development and Housing was established and with Civil Defence Law, search-rescue and first-aid principles, organization, duties, responsibilities of civil defence in emergencies were determined. Then in 1959, first comprehensive disaster law came into force, disaster fund was created and Ministry of Development and Housing took duties over from the Ministry of Public Works such as take pre-disaster and post-disaster measures, to make national planning, to solve the housing problem.

After 1960's, there were important developments in terms of reducing disaster damages both in the world and in Turkey. United Nations' works increased about natural hazards and disasters; many organisations were established. Necessity of economic and social dimensions in planning was understood. The military intervention in 1960 caused significant changes in terms of governance. State Planning Organization was established. Planned development model was adopted. 5 years development plans were made. New constitution came into force and earthquake regulation was revised in 1961. First department of planning was established in Middle East Technical University at the same year. Turkey Earthquake Zones Map revised in 1963. Metropolitan planning offices was established in Izmir, Istanbul, and Ankara in 1965. These offices prepared master plans in metropolitan areas. General Directorate of Disaster Affairs was established at the same year. In 1968, format of disaster preparedness and response activities regulated with the law no: 1051, and Regulation on Emergency Aid Organization and Planning Principles Regarding Disasters came into force. Turkey Earthquake Zones Map revised again in 1972. Same year in the metropolises, ministry was given the authority to plan above the municipalities, and earthquake fund created. Then in 1975 earthquake regulation revised again.

After 1980 was important, in terms of disaster management especially at international level. Globalization process started and new international actors was appeared, internet became widespread, access to information became easier. Resilience concept used firstly in the field of disaster. The military intervention in 1980 caused significant changes in Turkey. Disaster first time described as an emergency state with State of Emergency Law. Ministry of Public Works and Settlement was established in 1983. Then TOKİ was established in 1984. Planning Law No. 3194 came into force in 1985. Local governments were authorized for the preparation and execution of master plans with this law. UN declared years between 1990-2000 as the International Decade

for Natural Disaster Reduction and published International Framework of Action. In 1994, I. World Conference on Natural Disaster Reduction was held in Yokohama, Japan. However, Turkey followed the world behind in terms of these developments. There were still post-disaster rehabilitation regulations and laws in that period, too. In 1992 a law came into force for only Erzincan, because of the great earthquake damage. Its aim was compensated for earthquake losses. In 1995, a similar law came into force for other regions affected by the disasters. Then in 1996, Turkey Earthquake Zones Map revised fourth times. With the light of it, first institution about disaster management, Prime Ministry Crisis Management Centre, was established. Its aim was mitigation of negative disaster results, coordination and cooperation with the relevant ministries, institutions, and organizations. And earthquake regulation revised again in 1998.

1999 is most important breaking point for earthquake risk management both national and international level. In that year, United Nations International Strategy for Disaster Reduction (UNISDR) was developed and United Nations Office for Disaster Risk Reduction (UNDRR) was established. The effects of Marmara earthquake necessitated taking precautions against natural hazards, developing new strategies, renewing the legislation, and increasing the durability of the building stock for Turkey. Disaster unpreparedness of the country was understood. Disaster perspective changed and disaster related works increased. Radical and fundamental legal and institutional changes was made, many decree laws were issued. With these decree laws, earthquake insurance became mandatory, regulations for private sector were made regarding the inspection of structures other than public buildings. In 2000, General Directorate of Emergency Management of Turkey and National Earthquake Council were established. However, with these authorities and responsibilities regarding disasters became even more complex. In 2001 new constitution came into force. In 2005, II. World Conference on Disaster Reduction was held in Kobe, Japan and Hyogo Framework for Action 2005-2015 was developed. In 2007 Turkey's earthquake regulation revised again and National Earthquake Council was closed. In 2009, AFAD was established. It was the first comprehensive institution about disasters. Aim of the establishment was to eliminate institutional complexity. Thus, disaster-related institutions merged. In 2011, Ministry of Environment and Urbanization was established and State Planning Organisation closed. In 2012, Catastrophe Insurance Law and Transformation of Areas at Disaster Risk Law No: 6306 came into force. Sendai Framework for Disaster Risk Reduction 2015-2030

was developed by UN in 2015. Then, Turkey Earthquake Zones Map revised again 2018. And with the light of these all, earthquake regulation revised in 2019. Same year, the pandemic spread around the world. Cities, housing preferences, planning approaches and perspectives on disasters were changed again. In 2020, İzmir suffered great damage due to the earthquake. Thus, 2021 declared the year of disaster education in Turkey. Finally, the most devastating earthquake in the history of the republic, Kahramanmaraş earthquake, occurred in 2023.

In the scope of this thesis and accordance with the research questions, the developments in the legal and institutional background of earthquake management in spatial planning are given in Table 17 and Figure 12, categorized periodically, and evaluated from a national and international level.

Table 17. Synthesis of Legal and Institutional Background of Turkey Related to Earthquake Risk Management in Spatial Planning

PERIOD	KEY ISSUES	LEGAL-INSTITUTIONAL DIMENSION
1923-1945	<ul style="list-style-type: none"> - Development more on planning rather than disaster issues - Post-disaster rehabilitation processes & rebuilding of capital - Technological inventions changed cities - New form of planning and planners appeared - Planning as “Bureaucratic Profession” & an instrument for modern nation & for social class regulation - Institutionalization of planning & spread of planning activities - Disaster perception shifted from act of nature to nature-human interplay 	<ul style="list-style-type: none"> - 1923: Republic of Turkey & first constitution in 1924 - 1923: Ministry of Development and Housing (Mübadele, İmar İskân Bakanlığı) (<i>Urban planning became mandatory. Preparing master plans, supervising, and building houses for disadvantages was duty of municipalities</i>) - 1925: “First planning law of the republic” Building Act - 1934: Municipal Expropriation (Belediyeler İstimlak) Law No. 2722 (<i>Engineers and architects were responsible to the preparation of the maps</i>) - 1940: “First laws related with the earthquake” Laws No:3908, No:3773 related with after Erzincan earthquake (in 1939) (<i>They include post-disaster recovery processes</i>) - 1944: “First law related with the earthquake risk management” Law on Measures to be Taken Before and After Earthquakes No. 4623 (Appendix 1) (<i>About measures by central government such as determination of earthquake zones and need for new buildings, making necessary ground surveys, preparation of aid and rescue programs</i>)
1945-1960	<ul style="list-style-type: none"> - 1939-1945: World War II - Emphasis of cities shifted from pure aesthetic to functionality & efficiency - Service provision & problem solution became priority - Planning was perceived as an “interdisciplinary profession” - Planning paradigm shifted from physical to comprehensive rationalist - Planning perspective shifted from architecture’s extension to multidisciplinary social science - First foundations for planning education 	<ul style="list-style-type: none"> - 1945: Transition from single-party system to multi-party system (<i>State concept changed</i>) & Establishment of Ministry of Public Works (Bayındırlık Bakanlığı) - 1945: “Creation of Turkey Earthquake Zones Map” Turkey Earthquake Zones Building Regulation (Appendix 2) - 1947: Earthquake Regulation & revision in 1953 - 1947: Turkey Earthquake Zones Map revision (Appendix 3) - 1948: Law on Residences to be Built in Erzincan (earthquake in 1939) No. 5243 (<i>Again about, post-disaster recovery process</i>) - 1953: “First institution regarding earthquake” Earthquake Bureau establishment under the Ministry of Public Works (<i>Mitigation was aimed</i>) - 1956: “First law which determining of new settlements considering natural hazards & providing building control” Planning Law No. 6785 (İmar Yasası) - 1958: Establishment of the Ministry of Development and Housing with Law No. 7116 (İmar İskân Bakanlığı) (<i>Disaster-related duties determined</i>) - 1958: Civil Defence Law No. 7126 (<i>Search-rescue & first-aid principles, organization, duties, responsibilities of civil defence in emergencies were determined</i>) - 1959: “First comprehensive disaster law” & “Creation of disaster fund” Disaster Law No:7269 (<i>Duties, such as pre& post-disaster measures, national plans, solution of housing problem, shifted from Ministry of Public Works to Ministry of development and Housing</i>)
1960-1980	<ul style="list-style-type: none"> - Planning paradigm shifted: from modernism to postmodernism, from absolute rationality to communicative rationality, from master plan to structure plan, from physical design to behavioural design - UN works & organisations on natural hazards and disasters - Increasing emphasis on social sciences - Planning gained respect nationally - Necessity of economic and social dimensions in planning was understood - Need of planned development model (5-years development plans) - Planning competitions & new specializations 	<ul style="list-style-type: none"> - 1960: Military intervention & State Planning Organization establishment - 1961: New constitution & Earthquake Regulation Revision - 1961: “First planning department” METU first planning education - 1963: Turkey Earthquake Zones Map revision (Appendix 4) - 1965: Metropolitan planning offices in Izmir, İstanbul, and Ankara & Establishment of the General Directorate of Disaster Affairs - 1968- Law No. 1051 (<i>Format of disaster preparedness & response activities regulated</i>) & Regulation on Emergency Aid Organization and Planning Principles Regarding Disasters - 1972: Turkey Earthquake Zones Map revision (Appendix 5) - 1972: “Creation of earthquake fund” Law No. 1571 - 1972: Law No. 1605 (<i>In the metropolises, ministry was given the authority to plan above the municipalities</i>) - 1975: Earthquake Regulation Revision
1980-1999	<ul style="list-style-type: none"> - Globalization and new international actors - 1981: “First use of “Resilience” concept” in the field of disaster by Timmerman - 1990-2000: Declaration of International Decade for Natural Disaster Reduction (IDNDR) & publication of International Framework of Action was published by UN - 1993: EU establishment - 1994: I. World Conference on Natural Disaster Reduction in Yokohama, Japan - Criticism of the gap in the communication of the planners with the public & adaptation of more communication-oriented planning approaches - Increased service and informal sectors, regional imbalances & decreased population growth rate & redistribution of population, capital 	<ul style="list-style-type: none"> - 1980: Military intervention - 1981: Law No. 2479 (<i>Law No. 7269 in 1959 & Law No:1051 in 1968</i>) - 1983: State of Emergency Law No. 2935 (<i>Disaster described as an emergency state</i>) & Establishment of the Ministry of Public Works and Settlement - 1984: Establishment of TOKİ with Mass Housing Law No. 2985 - 1985: Planning Law No. 3194 (<i>Local administrations were authorized for the preparation and execution of master plans</i>) - 1992: Law No. 3838 (For Erzincan earthquake in 1992) (<i>Again, about post-disaster recovery process. Aim: compensate for earthquake losses</i>) - 1995: Law on the Execution of Services Regarding Damage and Destruction Caused by Natural Disasters No 4123 (<i>similar to Law No.3838, prepared for other regions affected by the disasters</i>) - 1995: Law No. 4133 (Basic disaster law no 7269 amended for the third time) - 1996: Turkey Earthquake Zones Map revision (Appendix 6) - 1997: “First institution about disaster management” Establishment of Prime Ministry Crisis Management Centre with Regulation No. 96/8716 (<i>Aim: least damage, coordination and cooperation with the relevant ministries, institutions, & organizations</i>) - 1997: Law No. 4264 (<i>In some regions, taxes of exposed people were cancelled</i>) - 1998- Earthquake Regulation Revision
After 1999	<ul style="list-style-type: none"> - 1999: United Nations International Strategy for Disaster Reduction (UNISDR) was developed & United Nations Office for Disaster Risk Reduction (UNDRR) was established - 1999: Marmara Earthquake “A Breaking Point in Terms of Earthquake Perspective” - Understanding of Turkey’s disaster unpreparedness - Radical and fundamental legal and institutional changes - Disaster perspective changed & disaster related works increased - Planning policies shifted to strategic-based and more flexible - 2005: II. World Conference on Disaster Reduction in Kobe, Japan & Hyogo Framework for Action 2005-2015 development - 2015: Sendai Framework for Disaster Risk Reduction 2015- 2030 - 2019: Covid-19 pandemic - Real estate preferences changed related to disaster, pandemic, and immigrants 	<ul style="list-style-type: none"> - 1999- Law No. 4452 (amended by Laws No. 4434 and 4540) (<i>Council of Ministers was authorized for decree laws for a period of ten months: ensuring coordination between relevant institutions, establishment of safe new settlements, a new insurance system, new provinces, and districts in the exposed region</i>) & Decree Laws (<i>Earthquake insurance became mandatory with No: 587; Regulations for private sector were made regarding the inspection of structures other than public buildings with No: 595</i>) - 2000: Establishment of the General Directorate of Emergency Management of Turkey - 2000: National Earthquake Council established & closed in 2007 - 2001: New constitution - 2007: Earthquake Regulation Revision - 2009- “First comprehensive institution about disasters” AFAD was established with Law No. 5902 (<i>Disaster-related institutions merged</i>) - 2011- Ministry of Environment and Urbanization was established & State Planning Organisation closed - 2012- Catastrophe Insurance Law No. 6305 - 2012- Transformation of Areas at Disaster Risk Law No: 6306 - 2018: Turkey Earthquake Zones Map revision (Appendix 7) - 2019- Earthquake Regulation Revision - 2021: Declared the year of disaster education

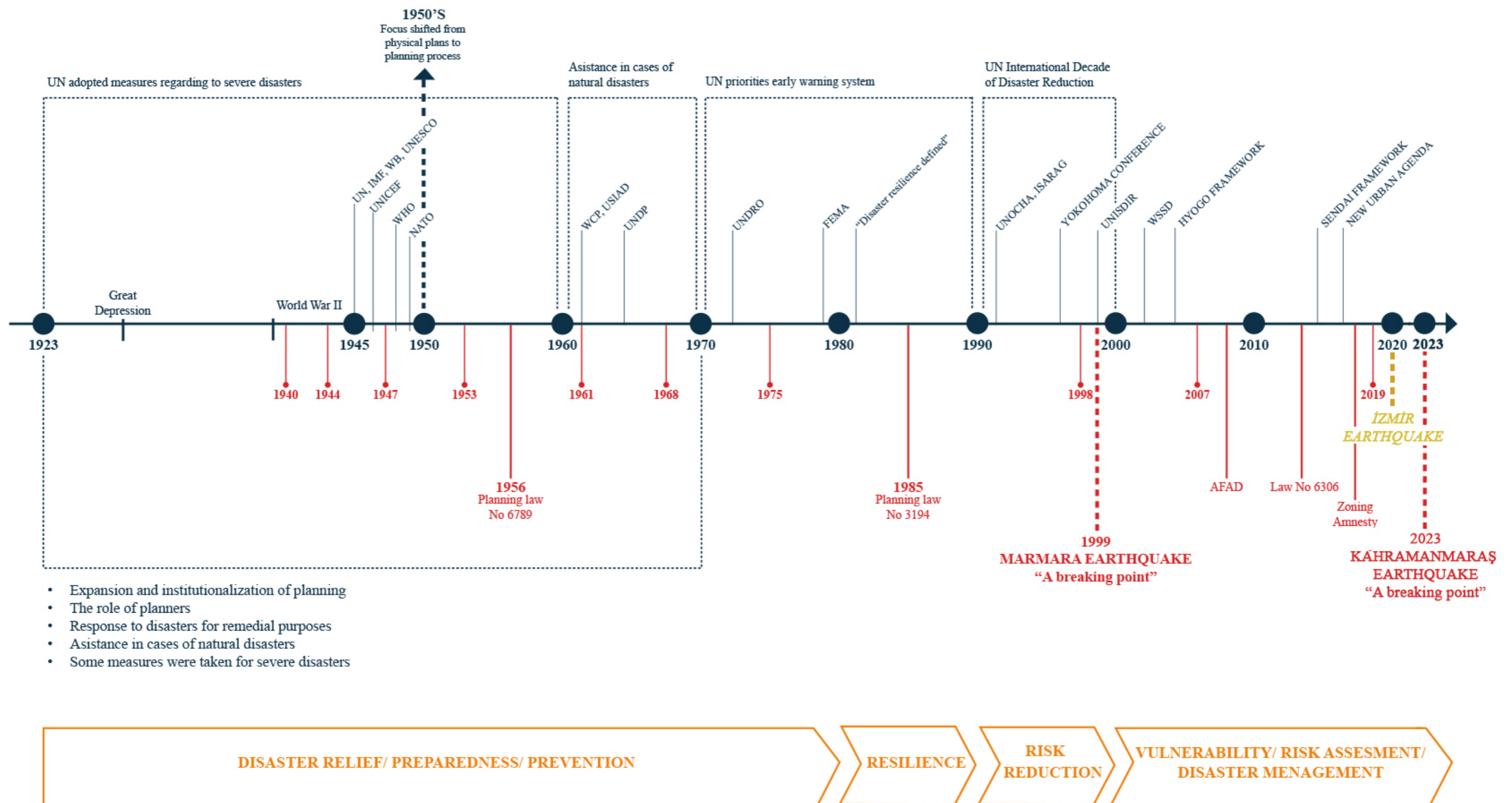


Figure 12. Development of Earthquake Risk Management in Turkey at National and International Scale

CHAPTER 5

STUDY AREA: ADALET, MANSUROĞLU AND MANAVKUYU NEIGHBOURHOODS IN BAYRAKLI DISTRICT

5.1. Location, Characteristics and Earthquake Hazard of Turkey

Turkey is a country surrounded by seas on three sides. Thus, there is diversity in such as the extent of the mountains, landforms, and climate types. Its location is strategically important because it is a country what a link between continents (Asia and Europe). It has important trade and transportation routes, ports, and rich historical, cultural, ecological, economical legacy. It has 81 provinces and 7 regions (Mediterranean, Black Sea, Aegean, Marmara, Central Anatolia, Eastern Anatolia, South-eastern Anatolia). Its total size is 783,356 km² and population is 84,680,273 (TurkSTAT 2021).

Among natural disasters, earthquake is the disaster with the most loss of life, injured, number of demolished and damaged buildings in Turkey (Table 18). There are many fault zones, seismic hazard zones. It is the most at-risk country for earthquake disasters worldwide for urban mortality and economic loss (Brecht et.al. 2013).

In the republican period, twenty-two devastating earthquakes occurred in the country. These were 1930 Hakkari, 1939 and 1992 Erzincan, 1942 Tokat, 1943 Samsun, 1944 Bolu, 1946 Muş-Erzurum, 1949 Bingöl, 1953 Çanakkale, 1966 Muş, 1970 Kütahya, 1975 Diyarbakır, 1976 and 2011 Van, 1983 Erzurum, 1995 Afyon, 1998 Adana, 1999 Kocaeli and Düzce, 2020 Elazığ and İzmir, 2023 Kahramanmaraş centred earthquakes as shown in previous chapter.

Table 18. Natural Disasters Occures in Turkey (2000-2015)

Source: Turkey Country Report, 2019 by Republic of Turkey, Prime Ministry Disaster and Emergency Management Authority

Disaster Type	Disasters	Loss of Lives	Injured	Demolished Buildings	Damaged Buildings
Landslide	3158	17	9	231	4217
Earthquake	1007	659	4258	2479	90379
Flood	809	72	47	201	33295
Avalanche	497	33	28	13	122
Extreme Winter Conditions	619	131	797	0	0
Storm / Typhoon	1398	172	152	4	883
Fire	1507	22	34	2	124
TOTAL	8995	1106	5325	2930	129020

5.2. Location, Characteristics and Earthquake Hazard of İzmir

İzmir is one of the three most important metropolitan cities of Turkey. It is the third most populated city in the country. Throughout its history, it has assumed the function of a busy trade centre. It is an important port city, and this is the most important factor affecting its development. Throughout its history, it has been damaged mostly due to wars, fires, floods, and earthquakes. Its 2022 population is 4.462.056 (TurkSTAT, 2022).

According to Provincial Disaster Risk Reduction Plan of İzmir (IRAP) (AFAD 2021), when Turkey Earthquake Hazard Map, outputs of TUBİTAK projects and the whole of the research carried out by scientists on the ground around İzmir bay are evaluated, three main results emerge. Konak, Buca, Balçova, Bornova, Bayraklı and Karşıyaka districts, which are densely built in İzmir, almost all in risk. Ground dominant vibration period values are greater than 1 second. This period refers to the time it takes for the ground to return to its previous state after vibration. For example, 10 seconds earthquake shakes ground more than 20 seconds. In most of the city, there is an old (30 years and above) building stock. In summary, the earthquake hazard and the existing

structure-ground relationship create a high earthquake risk, especially in the central districts where densely settled are located.

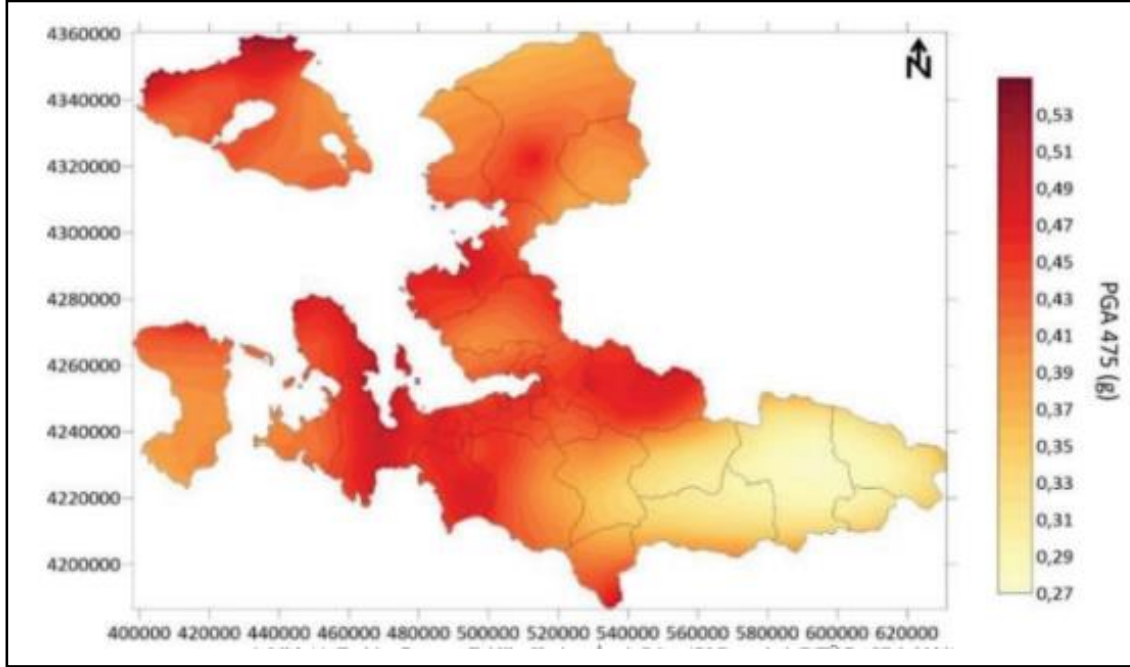


Figure 13. Earthquake Hazard Map of İzmir

Source: (DAUM 2020)

5.2.1. Active Faults of İzmir

According to the Active Fault Map of Turkey, within the borders of İzmir Province, there are a total of 21 faults evaluated as Holocene Fault/Quaternary Fault (17) and Neotectonic period linearity (4) class (Figure 14) and these have potential produce earthquakes of 6-7.2 magnitude (AFAD 2021). They are Bergama fault, Soma-Kırkağaç fault zone, Yeni Foça fault, Gülbahçe fault, Yağcılar fault, Seferihisar fault, Tuzla fault, İzmir fault, Güzelhisar fault, Menemen fault zone, Dağkızılca fault, Kemalpaşa fault, Kiraz fault, Halıköy-Beydağ fault, Tire fault, Ephesus fault, Zeytinadağı fault, Gümüldür fault, Mordoğan fault, Çeşme linearity, Dikili fault zone. Also, there are many active faults under the Aegean Sea, which borders the province from the west.

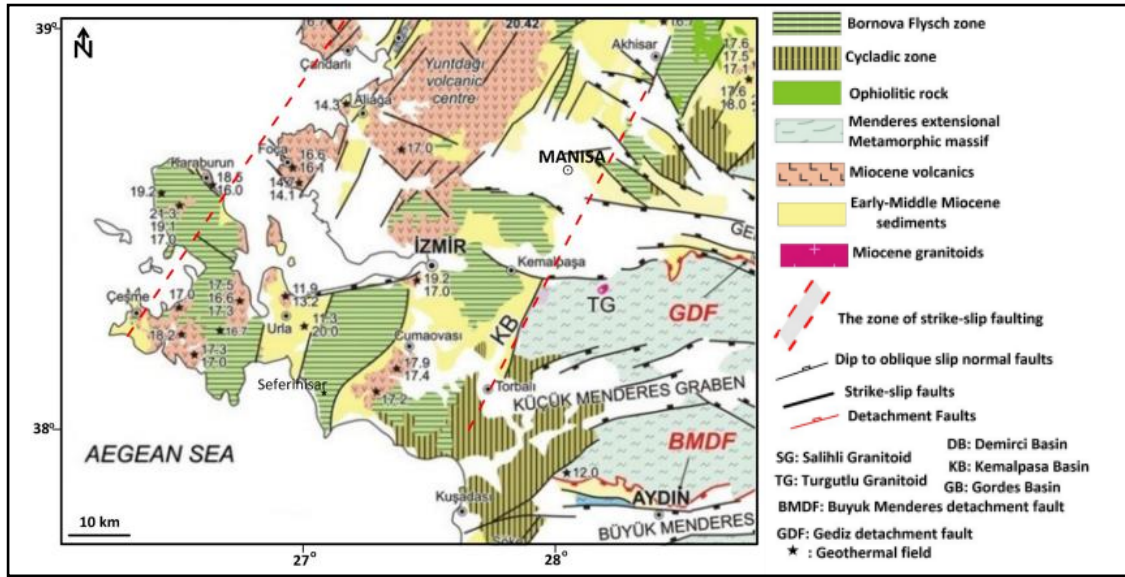


Figure 14. Geological Map of İzmir

Source: (Erbek-Kıran et. al. 2023)

On the other hand, there are active faults around Lesbos, Chios, Samos, and Ikeri Islands, which can affect İzmir in terms of shaking or tsunami when they produce earthquakes. These are: Mytilene (Lesvos) fault, Polichnitos-Plomari fault, Aghios Isidoros-Cape Magidas fault, Gulf of Geras fault zone, Aghia Paraskevi fault, Scala-Eressos fault, Gavathas fault, Aghasmata offshore fault, Oenousses offshore fault, Mastihochoia fault, Philadelphia offshore fault, Karlovası fault, Marathokambos fault, Vathy fault, Pythagorion fault, Samos fault, Ikaria Island active tectonic structures (Karkinagri, Cambos, Manganitis-Plakia, AghiosKyrikos, Southern Ikaria Offshore faults) (AFAD 2021).

5.2.2. Earthquake History of İzmir

Aegean Region is one of the most seismicity active regions in the world and historical earthquake records date back to 2500 years ago (332 of them are belongs to before 1990) (Altunışık et. al. 2021). 20,000 people lost their lives in the 688 earthquakes, over 15,000 people lost their lives in the 1688 earthquake, which caused serious destruction in and around İzmir city centre (Ergin et. al. 1967). Since 1900, which defined

as the instrumental period, 695 earthquakes with $M_w \geq 4.0$ have occurred, and the largest one of them is Aydın, Söke earthquake with 6.8 magnitude, for the region (Çınar et. al. 2021).

For İzmir, according to AFAD report (IRAP, 2021), there are more than 160 earthquakes with 3.5 magnitude and above, in instrumental period. 101 of them with $3.5 \leq M$ (magnitude) < 4 , 38 of them with $4 \leq M < 5$, 15 of them with $5 \leq M < 6$, and others with $6 \leq M$. The most significant ones are, in chronological order, in terms of damage and loss, 31 March 1928 Torbalı, 23 July 1949 Karaburun, 6 November 1992 Doğanbey and 30 October 2020 Samos earthquakes.

Table 19. Earthquake with Central Base İzmir ($M > 5$ Instrumental Records)

Source: (AFAD 2021)

DATE	HOUR	PLACE	INTENSITY	MAGNITUDE
19.01.1909	04:57	Foça	IX	6
31.03.1928	00:29	Torbalı	VIII	6.5
22.09.1939	00:36	Dikili	VIII-IX	6.6
23.07.1949	15:30	Karaburun	VIII-VII-X	6.6
2.05.1953	05:41	Karaburun	VII-VIII	5
6.04.1969	03:49	Karaburun	VII-VIII	5.9
1.02.1974	00:01	İzmir	VII	5.3
16.12.1977	07:37	İzmir	VIII	5.5
14.06.1979	11:44	Karaburun	VII	5.7
6.11.1992	22:08	Doğanbey	VII	5.7
24.05.1994	05:05	Karaburun	VII	5
10.04.2003	03:40	Urla	VII	5.6
17.10.2005	05:45	Urla-Seferihisar	VII	5.7
	09:46			5.9
	12:55			5.6
20.10.2005	21:40	Urla-Seferihisar	-	5.9
11.11.2010	21:08	Selçuk	-	5
12.06.2017	15:28	Aegean Sea	VI	6.2
17.06.2017	19:50	Aegean Sea	-	5.3
22.06.2017	02:48	Aegean Sea	-	5
30.10.2020	14:51	Aegean Sea, Seferihisar	VII	6.6
1.02.2021	08:46	Aegean Sea, Karaburun	IV	5.1

5.2.3. Development and Planning History of İzmir

Before Republican Period (B.C. 3000- 1923): Smyrna, lies to the northeast of the bay, to the south of Yamanlar Mountain, founded in 3000 BC, is the first known settlement of İzmir (Atay 1978). Later, Buca, Bornova and Balçova began to form, and population increased on the edge of the gulf, known today as the Kadifekale-Tepecik vicinity (Kemeraltı Urban Site Conservation Plan Report 2002). In summary, the city began to spread from the port area to the inner parts of the city. Until the 17th century, the city suffered a great earthquake, the small inner harbour in the centre was closed, the first shore filling works were carried out, and studies were carried out in Halkapınar and Buca to meet the water needs of the city (Atay 1978). In the 18th century, trade developed further, city centre nearly doubled, settlement developed by spreading outwards, functional diversifications occurred in Central Business District (CBD), land use structure enriched, and inner harbour were filled (Kıray 1972). In the 19th century, transportation and communication developed in Western Anatolia, foreign capital and investments increased, thus city's commercial identity strengthened (Kemeraltı Urban Site Conservation Plan Report 2002). Population increased first in Buca and Bornova, which are close to the city centre, then Karşıyaka and Gaziemir because of developed railways, roads, and sea transportation system (Kıray 1972). City plans can be traced back to the beginning of the 19th century, and the gulf maps to the 17th century (Pınar 2020). The first geological map was made in 1845 by Thomas Abel Brimage Spratt and "The first scaled plan (1/5000), which encompassed the entire city, was drawn up by the Italian engineer Luigi Storari between 1854-1856, and published in 1857" (Pınar 2020, 17).

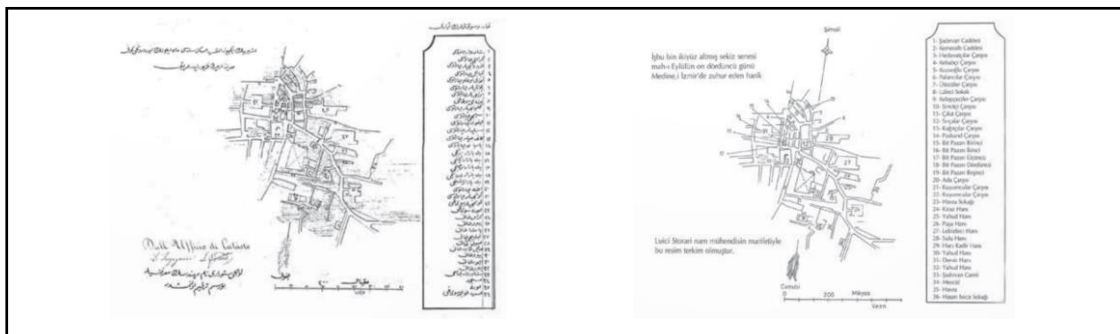


Figure 15. First Scaled Plan of İzmir

Source: (Pınar 2020, 34)

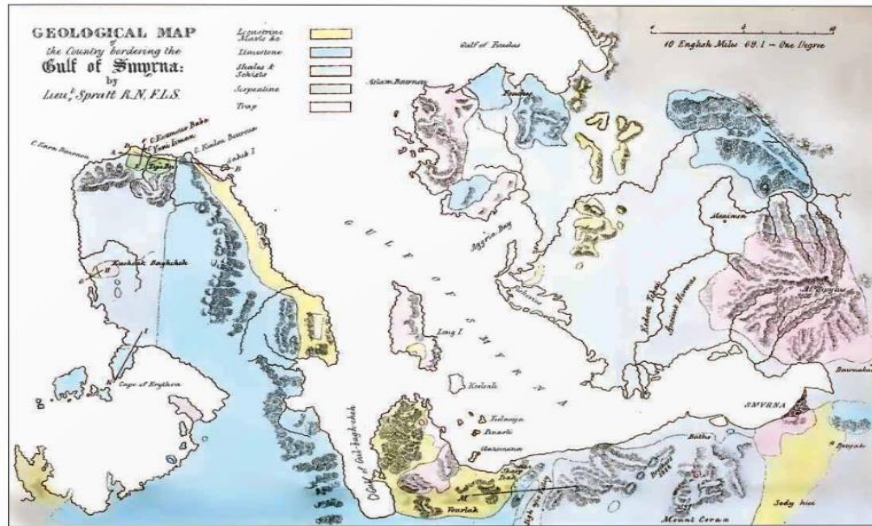


Figure 16. Earliest Geographical Map of İzmir

Source: (Pınar 2020, 35)

After Republican Period (1923-today): İzmir has preserved its character as a port city that developed around the gulf throughout its history. From the beginning of the urbanization process, the port is the most important factor. Although fragmentary plans were encountered around Konak (port area) and around Çeşme (İzmir Bay), which are known as the present city centre in the Ottoman period, a comprehensive planning study could not be followed in İzmir until the Republican period. However, it is one of the first examples of republican planning experience.

Planning practices of İzmir, on the one hand, developed in parallel with the important events in Turkey's political and socio-economic history, on the other hand, it followed the planning approaches developed in the West, albeit belatedly (Kaya 2002). However, reflection of the earthquake risk management approach on spatial planning has only started to be seen for the city since the 2000s.

In the post-republic period, seven city-wide planning applications were made for İzmir: 1925 Danger and Prost plan, 1949 Le Corbusier plan, 1955 Aru, Özdeş and Canpolat's competition project plan, 1960 Albert Bodmer plan, 1973 Metropolitan Planning Department plan, 1989 Metropolitan Municipality Plan, 2012 İzmir Metropolitan Environmental Plan. While 5 of them found a place in practice, 2 of them did not implement (1949, 1960 plans). And earthquake risk management studies in spatial

planning for the city can be examined under three periods: between 1999- 2005, between 2005- 2020, after 2020.

1. Rene & Raymond Danger and Henri Prost Plan, 1925: As mentioned before, throughout the history of İzmir, it has been mostly damaged due to war, fire, flood, and earthquake. With the establishment of republic, planning practices aiming at post-war recovery were replaced by modern urban planning efforts. Holistic modernist planning studies aiming to transform traditional society into modern society have been developed (Kaya 2002). Danger and Prost plan is the first city-wide planning study of Turkey during the republican period. However, it is also limited to fire areas and their surroundings, too. It is an example of post-disaster rehabilitation process in spatial planning. It covers the districts of Alsancak, Konak and Karataş, which form the center of İzmir. Its approbation year is 1925 and revision year is 1933. In the first stage in 1925, a limited development could be achieved for the city because of economic reasons. The revision reason was allocation space to fair. Because economic policies of the state changed, the focus shifted to industrial development and an international trade fair organization was wanted in İzmir in 1934. Legal framework supporting of that revision were Municipalities Law No. 1580, which entered into force in 1928, and No. 1590, which entered into force in 1930 (Kaya 2002, 101).

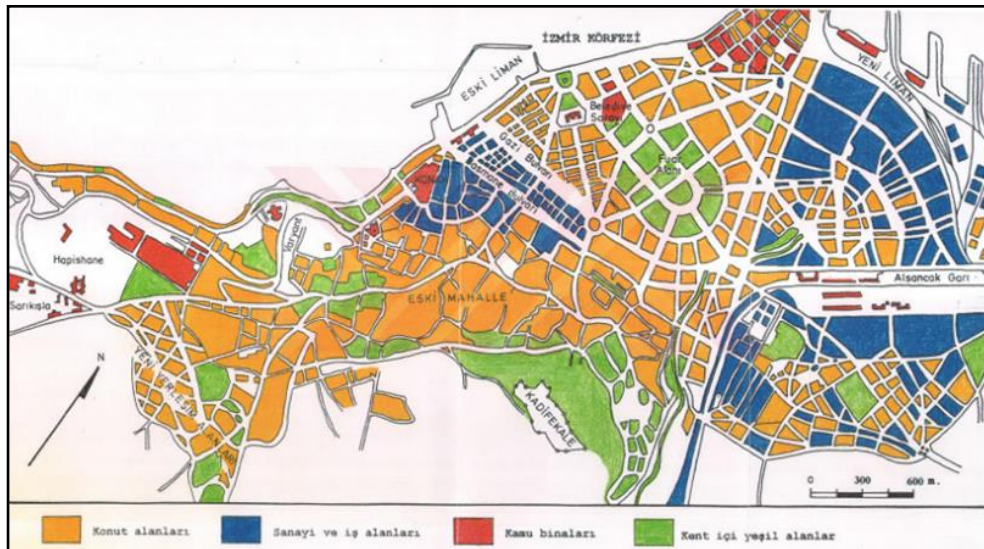


Figure 17. The Plan of Danger and Prost, 1925

Source: (İzmir Metropolitan Municipality Archives; Karadağ 1998)

2. Le Corbusier Plan, 1949: After the effects of the economic depression, the trade fair and the new government policies, the mobility in the city, population growth, spatial expansion and the emergence of squatters created the need for a new plan. An approach towards more practical and functional applications were adopted in planning. In 1936, the ministry started to work on a new plan. Municipalities were held responsible for the preparation of the necessary reports for the plan. The report prepared for the new city plan of İzmir was completed in 1939 and Le Corbusier was assigned for the plan. However, the plan was delayed due to World War II. In 1945, with the law no 4759, municipalities were obliged to prepare maps. And the draft plan, which was completed in 1949, could not be put into practice. Until the draft was prepared, the city did not change much due to the war. "While districts such as Güzelyalı, Göztepe, Karantina, Karataş, Bostanlı, Karşıyaka, Turan, Bayraklı, Salhane, Alsancak and the suburbs of Bornova and Buca continued to be the main residential areas, the Gürçeşme, Kadifekale, Boğaziçi, Gültepe and Ferahlı neighborhoods emerged in the post-war period" (Kaya 2002, 106). In addition, attempts were made during this period to expand the port and complete the airport and bus terminal. In summary, it is also an example of the post-disaster (man-made disaster) rehabilitation process in spatial planning, too. However, more than disaster hazard and risks, economic development and growth was the priority of the plan.

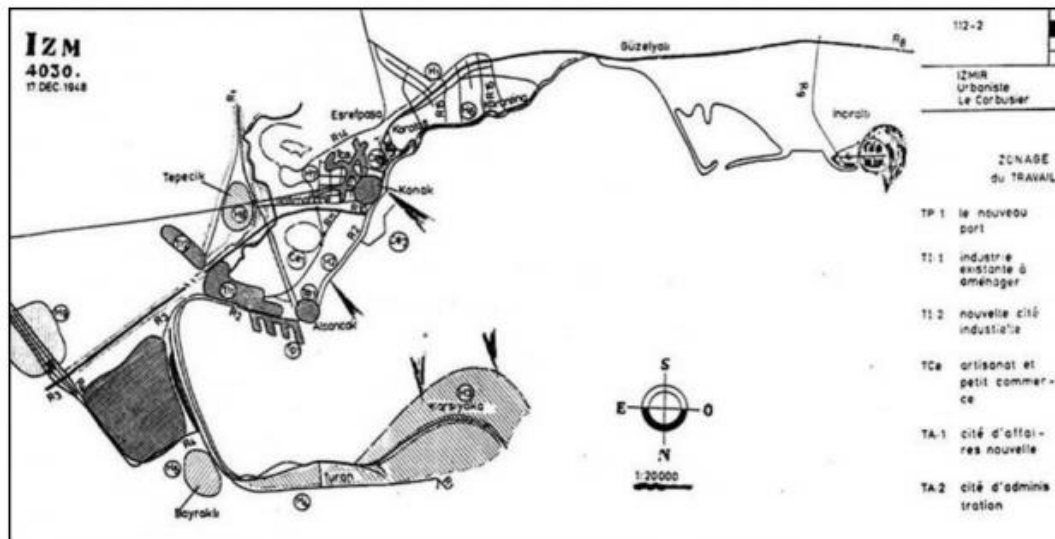


Figure 18. The plan of Le Corbusier, 1949

Source: (İzmir Metropolitan Municipality Archives; Kaya 2002)

3. Aru, Özdeş and Canpolat's Competition Project Plan, 1955: In the 1950s, new investments were made in İzmir. The reason for this was the change in the understanding of the state, policies focusing on industry and economic growth, and Marshall aids. The development of roads, factories, warehouses, and port caused the city to expand towards Halkapınar and Bayraklı. Thus, it was predicted that the population would increase rapidly and the need for a new plan arose. Based on the law enacted in 1945, map and partial planning studies were carried out in the early 1950s. In these studies, again, more than earthquake hazard and risks, economic development and growth, and urbanization issues (rapidly increased populations, squatters etc.) were the priority. The area between Göztepe and Kadifekale was converted from a first-degree earthquake zone to a second-degree earthquake zone by the ministry (Kaya 2002). Aru, Özdeş and Canpolat came first in the international planning competition held in 1951. And their plan was approved in 1955. The plan suggested; improvement of Alsancak port, being surrounding of the port (Bayraklı) an industrial zone, development of new neighbourhoods in Buca and Bayraklı, and afforestation in Kadifekale. However, the plan was insufficient because the population growth rate was much higher than predicted.

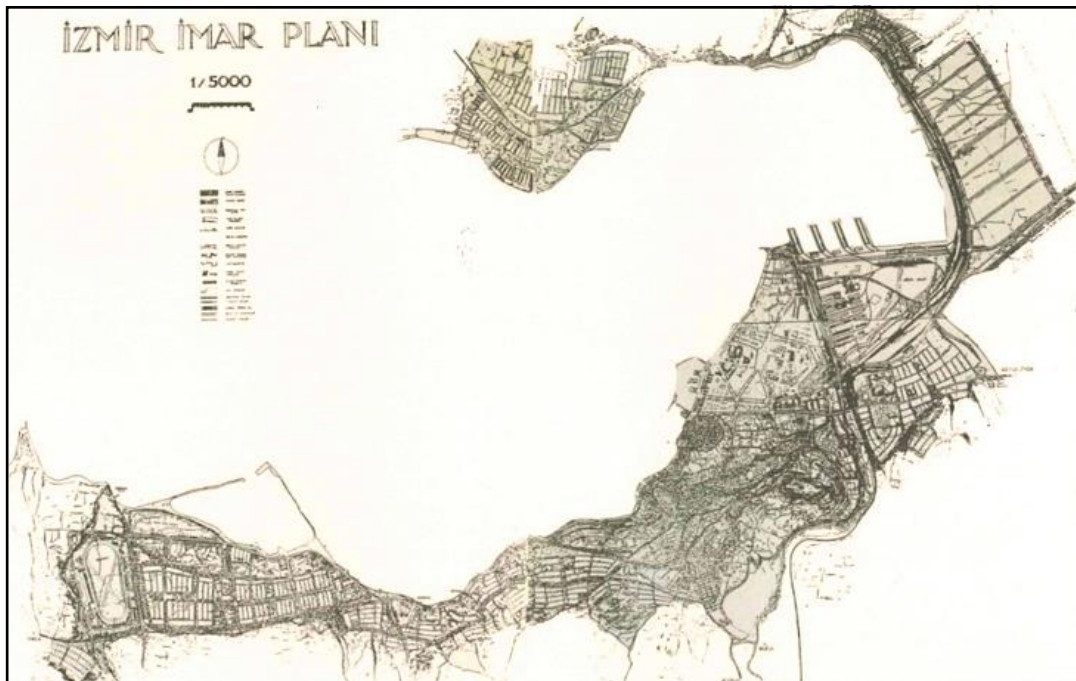


Figure 19. The Master Plan of İzmir, 1955

Source: (İzmir Metropolitan Municipality Archives; Gülersoy and Koramaz 2016)

4. Albert Bodmer Plan, 1960: After 1955 foreign debts increased, state policies changed and planned development was adopted. Authority in cities, in terms of growth and development, was transferred from the local to the central government with the law no 6785 in 1956, because of rapid urbanization and squatter problems. However, approbation of master plans and preparation of regional plans was duty of Ministry of Public Works and Housing, which established in 1958. Abrahams (a housing expert) suggested as a solution of these urbanization problems that “imperts” (not experts) are needed. Thus, studies on planning education started. And a new plan was made by Bodmer, for İzmir. It was drawn according to the borders that the city will expand during the metropolitanization process, not the existing ones. The main aim was defining industrial and residential development axes and the main transportation links (Kemeraltı Urban Site Conservation Plan Report 2002). The port was the focus, Alsancak and Konak were the central districts, Halkapınar-Mersinli-Salhane were small-scale industrial zones, Işıklar-Pınarbaşı were heavy industrial zones. And residential areas, which refers to Karşıyaka, Üçkuyular, Hatay, Bornova and Buca districts, were proposed around the industrial zones. In summary, prediction of the plan was that population and settlement density will grow towards to Bornova Plain. However, it could not find a place in practice because of the military intervention in 1960.

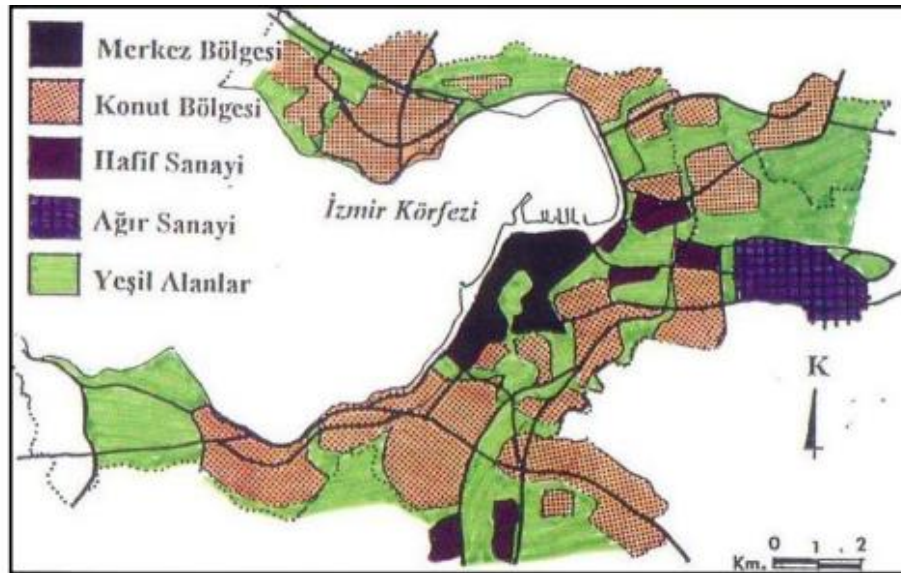


Figure 20. Bodmer Plan, 1960

Source: (Kemeraltı Urban Site Conservation Plan Report 2002)

5. Metropolitan Planning Department Plan, 1973: With the developments after 1960, State Planning Organization, General Directorate of Planning and Metropolitan Area Master Plan Offices were established. İzmir started to become a metropolitan city and therefore the need for a new plan was born again. Unlike the previous plans, the new plans were prepared for 5 years to adapt to the rapid change and metropolitanization process. 1973 plan is the first concrete example that deals with İzmir, as a whole. The squatter problem, which is closely related to the Bayraklı region, was on the agenda in this plan. It was prepared based on the law numbered 775. Improving squatters and preventing the formation of new squatter areas were aimed. Infrastructure services was emphasized. In this context, it can be considered as the first concrete example of the precautions taken before the disaster for the city. Because squatter areas have high vulnerability, and infrastructure systems are one of the key issues of the disaster management process. However, the plan was not sufficient for a solution due to economic-political reasons (Kaya 2002). In 1965, Izmir Metropolitan Area Master Plan Bureau was established under the General Directorate of Planning. After the studies carried out with detailed research, the 1/25000 scale İzmir Metropolitan Area Master Development Plan and its report prepared by this office were approved by the Ministry of Development and Housing in 1973. However, it lost its validity in 2003 based on the law numbered 3194 (Izmir Metropolitan Municipality Plan Report 2022).

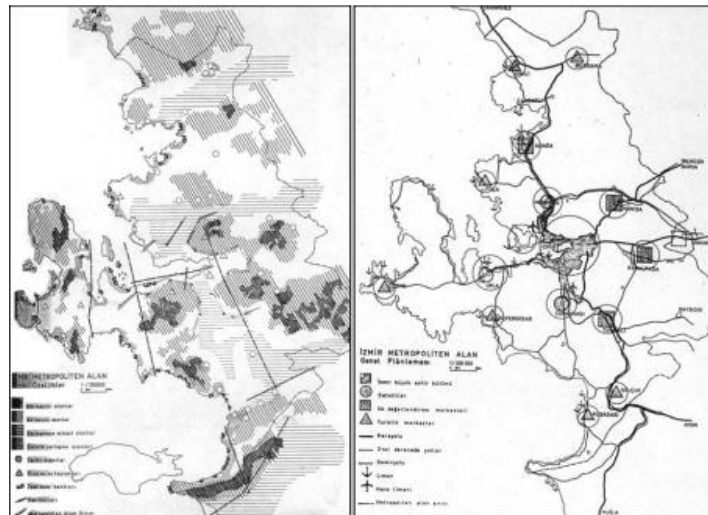


Figure 21. Physical Structure, Master Plan of the Metropolitan Area, 1972

Source: (İzmir Metropolitan Municipality Archives; Kaya 2002)

6. Metropolitan Municipality Plan, 1989: After 1970's, there were new state investment decisions and practices that changed the main decisions of the 1973 Plan. Urban structure was developed according to investments of government, and illegal residential and industrial areas increased. Thus, 1/25000 scaled İzmir Metropolitan Master Plan Revision was made by municipality, in 1989. It is "a local planning effort carried out after an important break point of Turkish history within the guidance of a new planning act" (Kaya 2002, 170). However, it lost its validity in 2002, based on that the Metropolitan Municipalities did not have the authority to make plans with a scale of 1/25000.

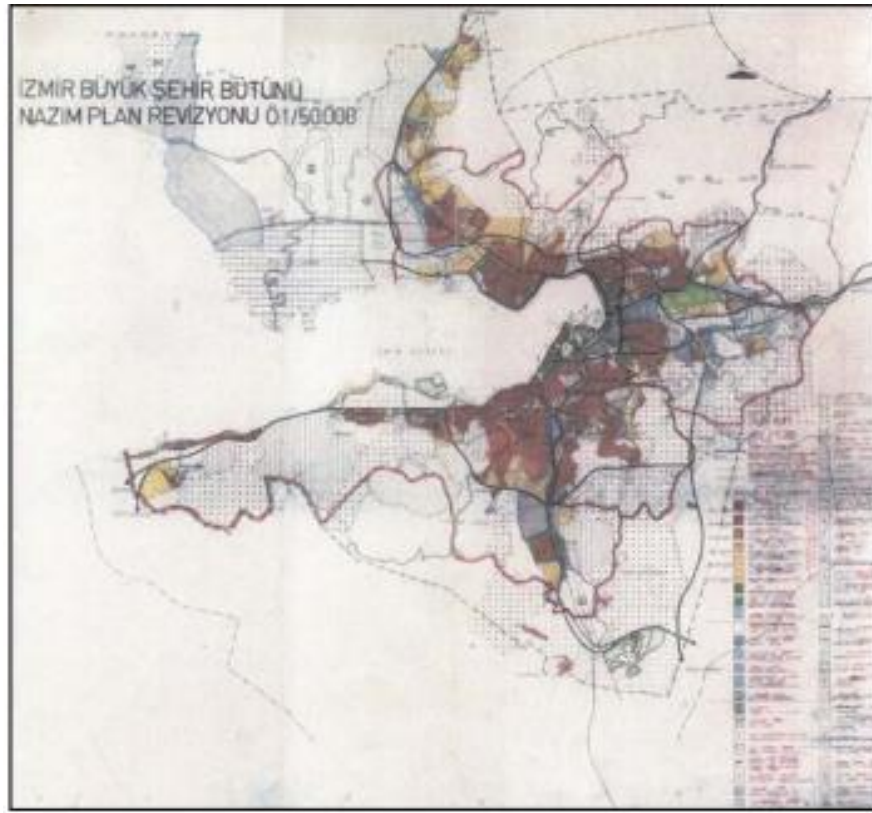


Figure 22. Metropolitan Municipality Master Plan, 1989

Source: (İzmir Metropolitan Municipality Archives)

7. İzmir Metropolitan Environmental Plan, 2012: Based on the law numbered 5216 in 2004, a 1/25000 scale Plan was prepared by the İzmir Metropolitan Municipality and was approved on 12.09.2012. The Geological Map of the General Directorate of Mineral Research and Exploration (MTA) was used as the basis for the plan (Details in Appendix

9). This plan is still in effect today. It covers the entire jurisdiction of the İzmir Metropolitan Municipality.

In the plan, the case study area is defined as the "Urban Built-up Area". Seismicity and earthquake hazard analysis are included in the plan report. There are provisions for disaster in the plan annotations. Accordingly, it is mandatory to carry out geological, geotechnical, and geophysical studies in sub-scale plans. And according to these reports, areas identified as having a high risk of liquefaction will not be permitted to construction. Although there was a zoning plan before this plan, if the unbuilt areas are determined to be high risk, the plan will be changed and these areas will be used as green areas or reserve areas for temporary uses after the disaster. Roads will be designed in a way that will not obstruct traffic flow after the disaster. All public open spaces will be used as assembly areas in case of disaster. In sub-scale plans, disaster-related aid, management, support, intervention, and assembly areas will be determined according to the predicted population. However, these were not reflected in practice.

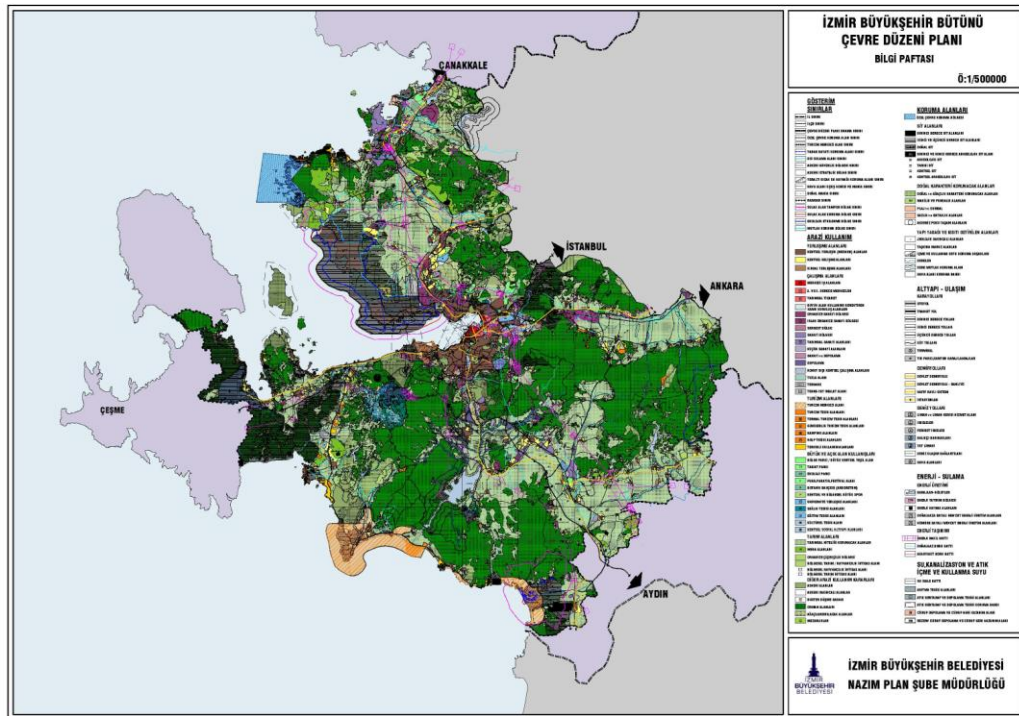


Figure 23. The Environmental Plan of İzmir Metropolitan Municipality, 2012

Source: (İzmir Metropolitan Municipality Archives, Plan Report)

As a summary of the development and planning history of İzmir, since the Republican era, the rapidly increasing population and the effect of industrialization have forced the city centre to expand. There have been some efforts in terms of disaster management in spatial planning for the city. However, that expand was realized mostly around economic factors. Despite the great destruction and repetition of disasters (flood, fire, earthquake, and war) in the city, generally hazards and mitigation of the risks have been not priority in planning practices. Especially before 1970's, relieving policies were followed, post-disaster rehabilitation were prioritized, only recovery processes, not risk mitigation efforts, were included in the planning practices. After that period, the efforts have increased in research and studies on hazards and for reducing the negative aspects of disasters. However, this situation could not be successfully integrated into spatial planning. Planning decisions that shape the city development were examined majorly by considering the commercial functions. It is certain that, the city is sensitive and vulnerable in terms of hazards and risks. When this fact is ignored, it is inevitable that hazards will turn into disasters.

5.2.4. Earthquake Risk Management Practices in Spatial Planning of İzmir

First study on disaster risk management for İzmir, in a concrete sense, was realized in 1999. Then, Seferihisar-Urla earthquake, in 2005 caused great damage and became an important breaking point for Izmir. And, Samos earthquake, October 30 in 2020 and caused serious loss of life and property is the second important breaking point for Izmir. That is why, earthquake risk management studies in spatial planning for the city can be examined under three periods: between 1999- 2005, between 2005- 2020, after 2020.

1. Between 1999-2005: Earthquake planning studies began for İzmir after the declaration of the "International Decade for Natural Disaster Reduction (IDNDR)" by the UN between 1990 and 2000, and the Marmara earthquake in 1999, which was a breaking point for Turkey. "RADIUS Project" was prepared by İzmir Metropolitan Municipality and Boğaziçi University and realized in 1999. Its aim was determining possible damages in a possible earthquake. It developed by evaluating the current built environment and earthquake performances in İzmir. It is the first study conducted not only in İzmir but also

throughout Turkey (Arkiş 2012). As a result of the project, “İzmir Metropolitan Earthquake Master Plan” was created. Plan report consisted of nine chapters. In the ninth chapter, some suggestions were made to reduce the risk of an earthquake that may occur in İzmir. This was the first, for a plan and its report. High earthquake risk of İzmir and unsuitable settlement conditions emphasized, earthquake risk maps were created. The plan developed based on an earthquake scenario. It depended on an earthquake with 6.5 magnitude, IX intensity, on the Izmir fault, in February, at night. And suggestions were designed at national and local scale.

Four major suggestions developed at national scale. First, instead of a completely centrally managed model, a disaster management plan should be prepared in cooperation of the Governor's Office, local administrations (municipality and headman), professional chambers and non-governmental organizations, and military forces. Regular meetings should be held in which these institutions participate regularly. Concrete results should be achieved in these meetings. Finally, necessity of preventing unlicensed constructions, supervising technical responsible during the project and construction process, and developing or regulating appropriate legal and institutional system for ensuring the control should be prioritized.

At local scale, suggestions were divided two as, pre and post disaster requirements. Pre-disaster requirements were:

- All information regarding geological, tectonic, and seismological structure, past earthquake statistics and earthquake hazard should be collected. Geotechnical evaluations should be made according to these data. Deficiencies should be determined by experts and studies should be directed accordingly. Micro-zonation and ground studies should be done, and plans should be prepared according to the results.
- Transportation components at risk (highway, railway, bridge, etc.) should be analysed detailly, then strengthened according to the results. Alternative routes should be created.
- Other infrastructure systems (electricity, communication, energy, and fuel, drinking water and wastewater etc.) should be designed by taking disaster into account.
- A "Disaster Management Centre" should be established (as in Tokyo and Los Angeles) that evaluates, conducts, and directs pre-disaster and post-disaster studies and all kinds of

disaster practices. The data should transfer here, supported by GIS, integrated with the emergency-rescue and training centre.

- Public buildings, which important for the city (security, fire department, hospital, administration, etc.), should be made resistant to earthquakes (However, such structures could not be examined within the scope of the plan).

- Continuity of planned commissions within the scope of RADIUS should provide, the earthquake risk management should remain on the agenda and the studies should be updated regularly in line with the suggestions developed.

- Training programs and organizations should be prepared with relevant institutions to raise awareness of the society.

- Neighbourhood-scale information should be transferred regularly and thus the data should be kept up to date.

- Considering the economic structure of the city, commercial and industrial activities should be determined, possible economic losses should be determined, and precautions should be taken.

- Appropriate techniques should be determined for the repair or strength of risky structures, socio-economic incentives for implementation should be developed.

- Basic precautions should be taken regarding the belongings in the buildings for the effects of the earthquake.

- Measures should be taken for artifacts and monuments exhibited in museums. Conservation of cultural heritage against earthquakes must be ensured.

And post-disaster requirements were:

- Disaster Management Plan should be constantly updated, other neighbourhoods and cities should be determined, and joint disaster planning departments should be established.

- Alternatives to the important structures and technical infrastructures at risk should be determined.

- Plans should be developed for keeping open emergency routes, determining of areas where earthquake victims will be placed and treated, transportation etc. other issues.

- Continuity of the functioning of the socio-economic system should be ensured. For this, vital urban services (such as cleaning services, public services, and health services) should be reinforced and backed up against earthquakes.
- Social awareness should be created.
- Drills should be conducted with the participation of relevant institutions and the public.

Then, in line with the legal and institutional framework that changed due to the Marmara earthquake, a Crisis Management Centre was established in 2001 under the auspices of the Governor's Office. However, this centre aimed to organize the work to be done after the disaster. In this period, disaster plans were prepared by the Provincial Disaster Bureau under the Directorate of Public Works and Housing. In 2002, an Earthquake Preparedness Drill was held by the Crisis Management Centre in the pilot area to test the mastery of the plans (Mersin and Şahin 2009). Also, during this period, this centre provided the coordination between institutions in the 5.7 and 5.9 magnitude earthquakes that occurred in Seferihisar and Urla, which were among the most devastating ones for İzmir. Although technical studies were carried out for the damaged areas, this period was unsuccessful in terms of earthquake risk management due to the lack of up-to-date plans, problems in terms of personnel and equipment, and inadequacies or disruptions in responding to the incident (Mersin and Şahin 2009, 37).

2. Between 2005- 2020: 2005 was an important breaking point in terms of earthquake risk management in spatial planning in İzmir. The earthquakes of 5.6-5.7-5.9 magnitudes occurred in Seferihisar and Urla and caused serious damage. After these earthquakes, İzmir's perspective on earthquakes began to change. The negative aspects of the process, which included partial and only legal and institutional changes that included interventions in the post-earthquake region, were observed extensively. Importance of disaster preparedness and risk reduction studies, earthquake risk management in the planning processes and the role of planning were emphasized. Provincial Emergency Aid Plan Revision was made in cooperation with the institutions established in the previous period. In this plan, logistics support system was designed, temporary accommodation, debris collection and dumping areas were determined. Also, it was decided to include Geographical Information Systems (GIS) in the planning processes for fast and effective access, and trainings on disasters were prioritized. İzmir Disaster Management Information System (İZAYBİS) was created. A project was developed, financed by İzmir

Development Agency (İZKA) and aimed to increase the effectiveness of disaster management within the framework of the plan revision. This project was implemented until 2010.

3. After 2020: October 30, 2020, earthquake was the second breaking point for İzmir. After the earthquake, in which many buildings were damaged and 117 people lost their lives, İzmir Metropolitan Municipality, the Ministry of Environment and Urbanization and local municipalities worked on the earthquake. Reserve Building Area Project was initiated by the Ministry. For this, a master development plan with a scale of 1/5000 was prepared. İzmir Metropolitan Municipality has prepared a Strategic Plan for the years 2020-2024. The goal of the plan was planned, safe, and durable construction and reconstruction of residential areas. On February 10, 2020, "Department of Earthquake Risk Management and Urban Improvement" and three directorates within were established within the Metropolitan Municipality. These directorates are "Disaster and Risk Management Branch Office", "Earthquake and Soil Investigation Branch Office" and "Engineering Geology Department" (İzmir Metropolitan Municipality n.d.). In November of the same year, a workshop was held with 14 universities, 25 public institutions, 14 municipalities, 38 non-governmental organizations and professional chambers, and 1000 participants and Disaster Science Committee was established (İzmir Metropolitan Municipality n.d.). Bayraklı Municipality, which is the local municipality of the region most damaged by the earthquake, universities, bar associations, professional chambers and bureaucrats were in this committee. As a result, the following decisions were made, creating a building inventory, making earthquake and tsunami survey, making microzoning studies, establishing a ground information system and a building and floor laboratory, creating a disaster platform. Studies on them are still continuing. Then, in 2021, the "Provincial Disaster Risk Reduction Plan" (IRAP) was developed by AFAD and the İzmir Governorship Provincial Disaster and Emergency Directorate. In this context, a workshop was held with the participation of public institutions and private organizations in İzmir. In the workshop, past disasters related to Earthquake and Tsunami and potential risk assessment of the province were made. A total of 4 probable and worst-case scenarios were developed, two for earthquakes and two for tsunamis. While preparing them, information such as the biggest earthquake may affecting the city, the biggest earthquake in the past, the biggest earthquake may produce by the active fault, and the fault length-magnitude relationship were taken into consideration. First scenario,

"probable earthquake scenario", was an earthquake with $M_w=6.7$, the epicentre as a district in the periphery (Menderes), on the Tuzla Fault. Its result showed that many neighbourhoods of Balçova, Bayraklı, Bornova, Buca, Çiğli, Gaziemir, Güzelbahçe, Karabağlar, Konak, Menderes, Menemen, Narlıdere, Seferihisar, Torbalı and Urla districts may be affected.

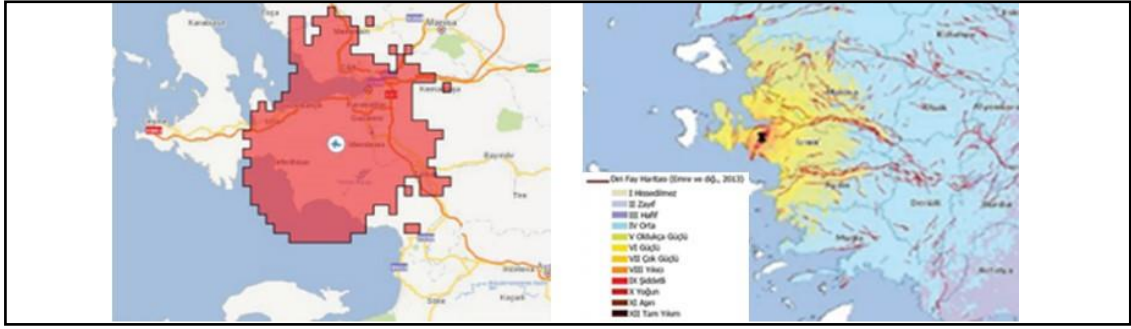


Figure 24. Probable Earthquake Scenario Impact Area (Tuzla Fault $M_w=6.7$)

Source: (AFAD IRAP 2021)

Second scenario, "worst-case earthquake scenario", was an earthquake with $M_w=6.6$, the epicentre as a central district (Konak), on the İzmir Fault. Its result showed that again, many neighbourhoods of Balçova, Bayraklı, Bornova, Buca, Çiğli, Foça, Gaziemir, Güzelbahçe, Karabağlar, Karaburun, Karşıyaka, Kemalpaşa, Konak, Menderes, Menemen, Narlıdere, Seferihisar, Torbalı and Urla districts may be affected.

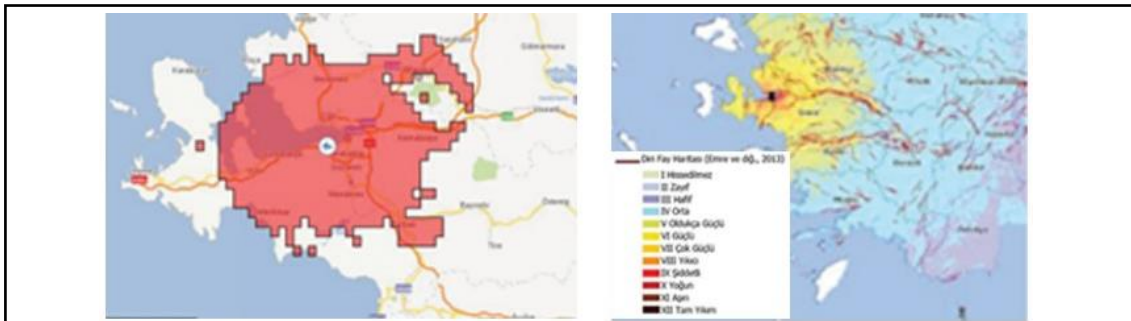


Figure 25. Worst-case Earthquake Scenario Impact Area (İzmir Fault $M_w=6.6$)

Source: (AFAD IRAP 2021)

In the light of these scenarios, impacts and consequences of the earthquake were assessed, causes, and triggering factors of the earthquake hazard to turn into a disaster were determined. For example, assessed economic impacts and consequences of the earthquake are high rehabilitation costs of damaged buildings, infrastructure systems (electricity, natural gas, water lines, etc.) and transportation systems (roads, railways, bridges, etc.), Chemical Biological Radiological Nuclear (CBRN) threats, disruptions in logistic resource use, health services and search-rescue efforts, high costs of psychological support services. And assessed natural and the environmental impacts and consequences of the earthquake are surface deformations, landslides triggered by the earthquake, and the topographical change due to these, flow rate and temperature changes in geothermal resources, lateral spreading and collapses in coastal areas, housing, personal and environmental cleaning issues. Disruptions in daily life are interrupted services (electricity, water, natural gas, etc.) in exposed areas, stopped transportation, failure to meet shelter and nutrition needs, high traffic density and health problems caused by demolition works, water shortages (caused by infrastructure, dam etc. damages), cultural heritage loss, looting actions. Determined causes, and triggering factors of the earthquake hazard to turn into a disaster are settlement of major İzmir's urban population along fault lines, failure to audit compliance with Earthquake Regulations, not reducing the risky building stock by taking the necessary precautions, failure to work on strengthening the structures, absence or not considering of the Geological-Geotechnical Survey Reports and Soil Surveys Based on Planning in the settlement suitability assessment, failure to implement and revise the Earthquake Master Plan made in 1999, opening stream beds and agricultural lands with high risk of liquefaction for construction, unplanned settlements like squatters, illegal or distorted structures, absence of pre-disaster zoning plans according to up-to-date population density and immigration status, failure to periodically check building stock, absence of continuously and regularly structural/performance inspections of the buildings (especially including the foundation), allowing the use of buildings with occupancy permit (with zoning amnesty) for purposes other than those given in the building license.

Then, on June 3, 2021, İzmir Metropolitan Municipality Zoning Regulation came into force. This regulation plays an active role in the current urban transformation processes. For example, a plan annotation with no loss of property rights was proposed to promote the renovation of damaged buildings, which called "Current Plan Status

Preserved Areas” (Mevcut Plandaki Durumu Korunacak (K) Alanlar). Finally, with the impact of the Kahramanmaraş earthquake, with the change in the Planned Areas Zoning Regulation (Planlı Alanlar İmar Yönetmeliği) on May 12, 2023, measures regarding earthquake resistance were developed by emphasizing the licensing phase of buildings.

5.3. Location, Characteristics and Earthquake Hazard of Bayraklı

Bayraklı district is one of the 30 districts of İzmir province. It is among the central districts. It is in the northeast of İzmir Bay. It includes the main transportation networks connecting the north and south of the city. The ancient city of Smyrna (Bayraklı Tumulus), known as the oldest settlement of İzmir, is located within the borders of Bayraklı. Therefore, it is important for the history of İzmir (Ministry of Culture and Tourism, 2020). Its 2022 population is 298,519 people, making up 6.7% of İzmir's population (TurkSTAT, 2022). It has 24 neighbourhoods (Figure 26).



Figure 26. Location of Bayraklı in İzmir

Source: (Esri, USGS, NDAA ; Prepared by autor)

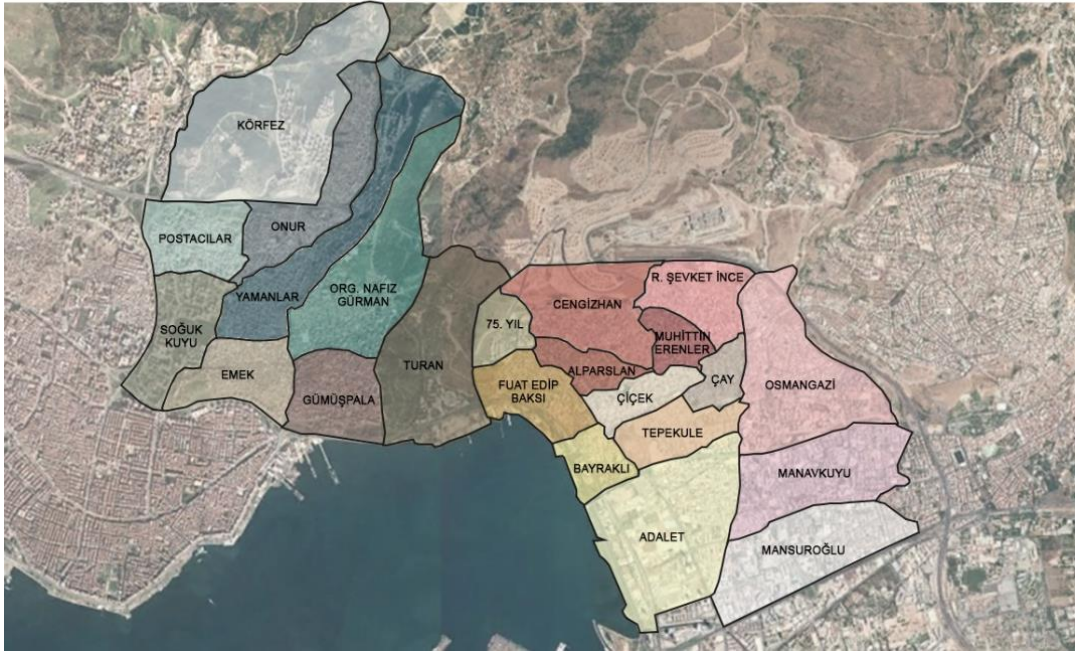


Figure 27. Neighbourhoods of Bayraklı

Source: (Esri, USGS, NDAA ; Prepared by autor)

Throughout its history, İzmir has received intense immigration. This situation has led to significant changes in Bayraklı district as well. Levantine structures, plains, vegetable and fruit gardens, agricultural and forest areas have replaced by slums and multi-storey apartments over time. In the first years of the Republic, Bayraklı was a low-density settlement and periphery area containing a few factories such as the Turkish Pasta Factory and Turyağ Factory (Altinkilit 2022). After the 1950s, squatting began, especially in public lands. After the 1980s, agricultural areas and plains started to build, and unplanned settlement pattern continued. And "Bayraklı" was established as a district in 2008, pursuant to the law No.5747. Previously, some of its neighbourhoods were in Bornova and some in Karşıyaka. After the 2000s, high-rise buildings and commercial activities started to increase in the region. Due to the increasing demand for housing in the city centre, it became a re-formed region with its modern identity. With the declaration of the city centre in 2012, skyscrapers started to be built in the northern part of the district (Figure 28). Because of high migration rate of district, 60 hectares of Cengizhan, Alpaslan and Fuat Edip Baksi neighbourhoods, which densely occurred with squatters, were determined as an urban transformation area in same year. And Muhittin Erener, Çiçek and Çay neighbourhoods were determined as areas where urban rehabilitation should be

carried out, because of low housing quality, unplanned urbanization, and disaster risks (Figure 29) (Özkan 2019). And with 2020 earthquake building stock damaged seriously (Figure 30, 31). And it is in the urban transformation process since then.



Figure 28. Silhouette of Bayraklı from Izmir Alsancak Port

Source: (Figen AKPINAR's Personal Archives)

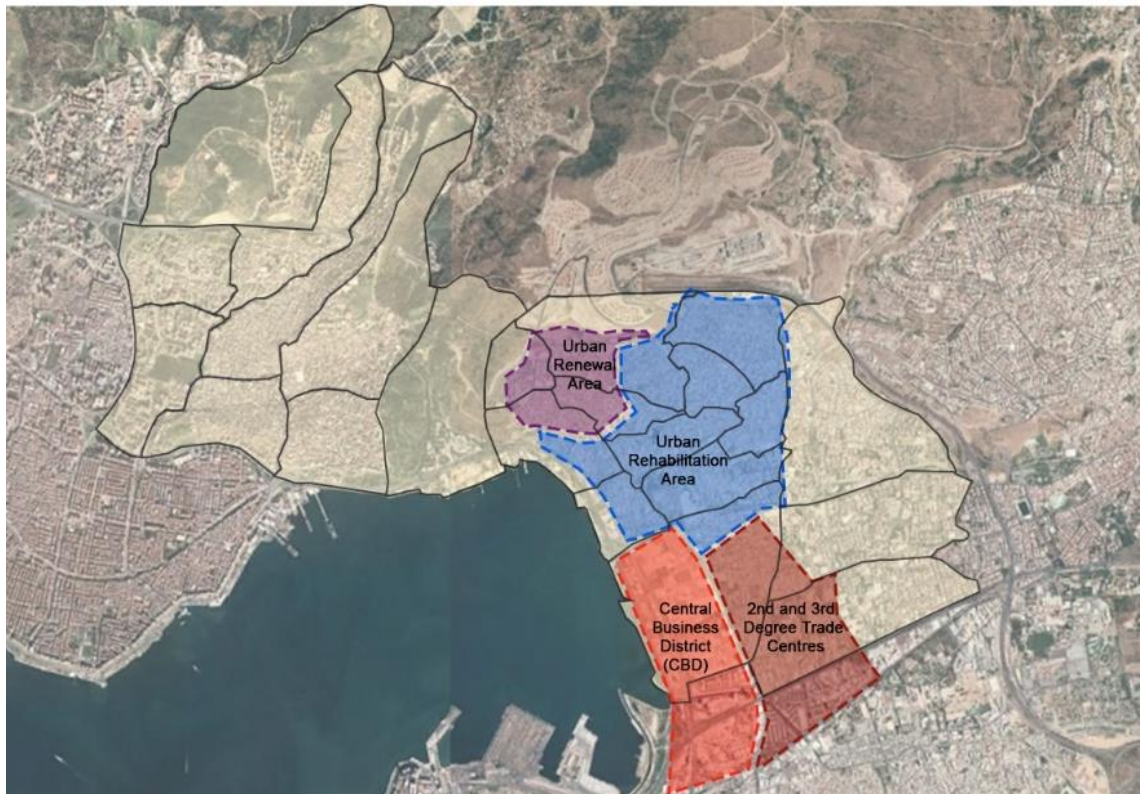


Figure 29. Zoning Map According to Flagged Housing Texture

Source: (Altinkilit, 2022, Revised by author)



Figure 30. Chronological photos from the earthquake exposed area

Source: (Gazete Duvar 2020; Author's Personal Archives 2023)



Figure 31. 30 October 2020 Earthquake Damage Intensity Map

Source: (TMMOB İzmir İKK 2020; Çınar et. al. 2021)

Bornova- Bayraklı- Karşıyaka consists of alluvial plains. Bay and mountains surround these alluvial plains. This geographical environment has been effective in the

urbanization process. However, it has negative consequences too. It causes a compact, enclosed built environment. Being close to the port makes the region attractive in terms of industrial activities, triggers growth and development. In this case, growth and development pressure poses a threat to the region.

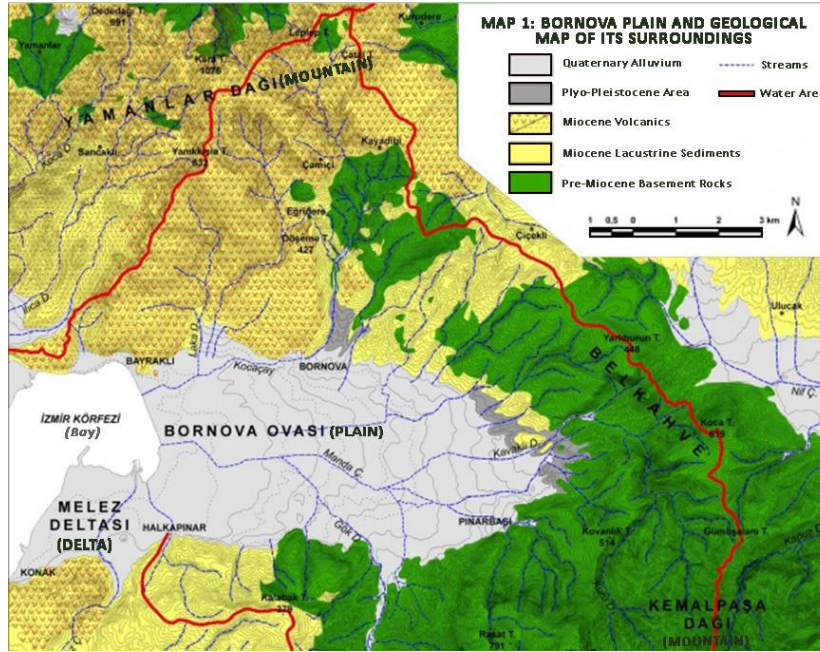


Figure 32. Geological Map of Bornova Plain

Source: (Karadaş 2012)

5.4. Location, Characteristics and Earthquake Hazard of Study Area

In 30.10.2020 at 14:51, the epicentre of the Aegean Sea, Seferihisar-İzmir offshore (Samos Island), instrumental magnitude $M_w=6.6$ (AFAD), $M_w=6.9$ (B.Ü. Kandilli Observatory and Earthquake Research Institute), on the 30 km long Samos Fault, an earthquake occurred 14.9 km deep into the ground. From the main shock to 09.12.2020 (on the 41st day), 5099 aftershocks with magnitudes ranging from 0.9 to 5.1 were recorded. The apparent duration of the main earthquake was 15.7 seconds according to the first calculations (Çınar et. al. 2021). The most affected area was Bayraklı district (especially Adalet, Mansuroğlu and Manavkuyu neighbourhoods) from the earthquakes,

because of the problems in the relationship between the building and the ground (Figure 33). The damage concentrated in 7-10 storey buildings. One other reason to this was that more earthquake forces acted on these buildings due to the ground amplification effect (Çınar et. al. 2021). Bayraklı was followed by Bornova and Karşıyaka districts. Serious structural damages and loss of lives occurred, some buildings collapsed in these districts, especially in buildings designed and licensed according to earthquake regulations prepared at different times. Apart from this, old masonry buildings were damaged in some villages on the Karaburun peninsula. It was observed that the dents and damages in the city centre of İzmir, which is relatively far from the earthquake centre, were more than the areas close to the focal point (Seferihisar, Kuşadası, etc.) (İMO 2020).

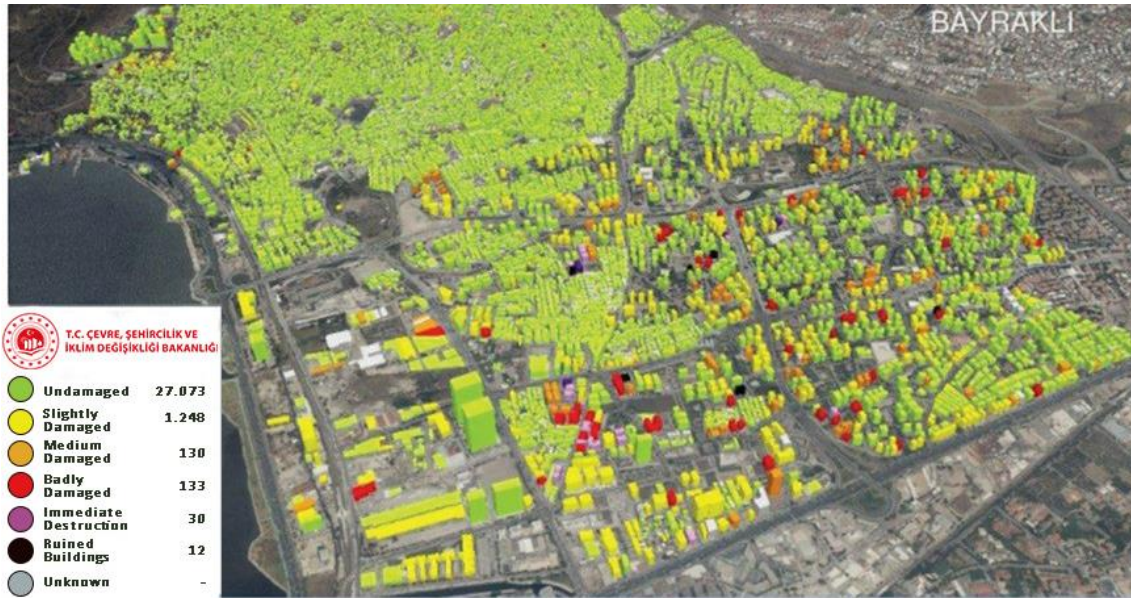


Figure 33. Damage Status Satellite Image

Source: (Ministry of Environment and Urbanization Provincial Directorate; AFAD IRAP 2021)

For this reason, Adalet, Mansuroğlu and Manavkuyu neighbourhoods of Bayraklı district were determined as the study area. In this area, there is a mixed urban texture consisting of industrial areas and warehouses, skyscrapers, business areas, commercial activities, residential areas, and squatters.

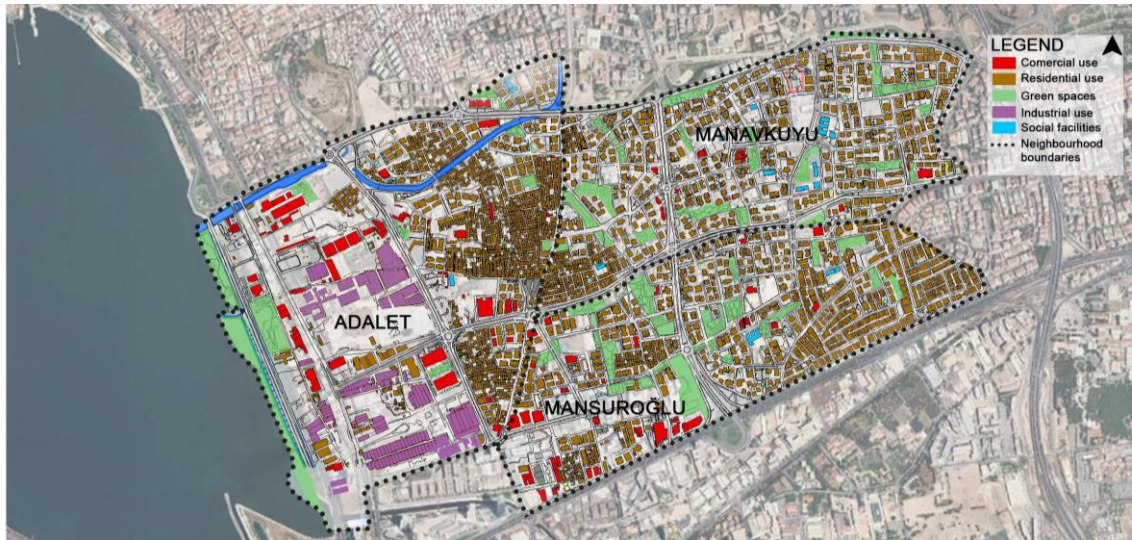


Figure 34. Land Use of the Study Area

Source: (Data from İzmir Metropolitan Municipality, Visualized by Author)

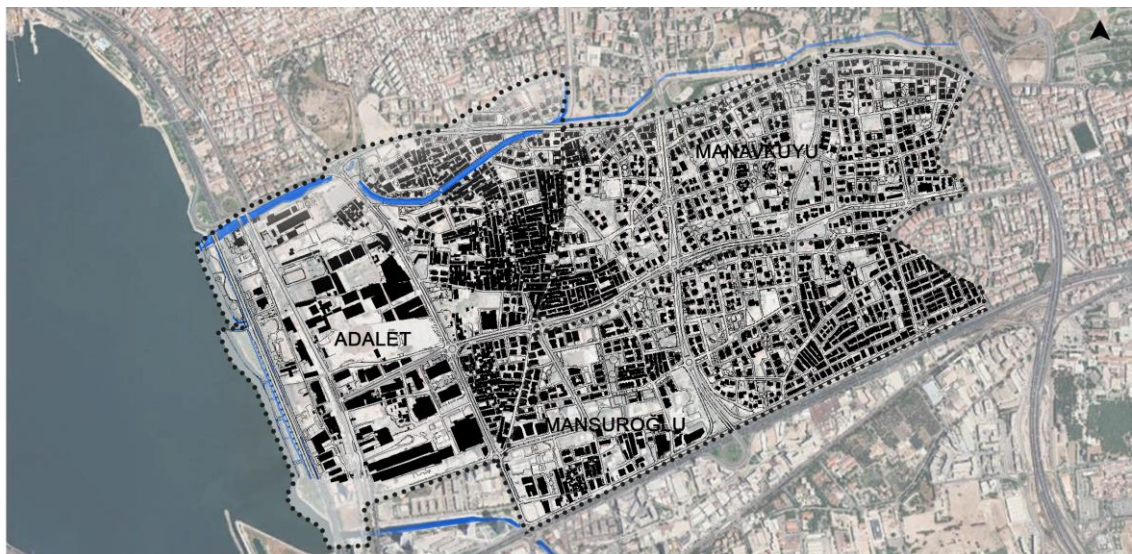


Figure 35. Solid-void map of the study area

Source: (Data from İzmir Metropolitan Municipality, Visualized by Author)

The fault map and slope map of the study area and its surroundings are shown below. It includes a settlement spread across the plain, has streams and fault lines, slopes close to sea level but is surrounded by high-slope areas.

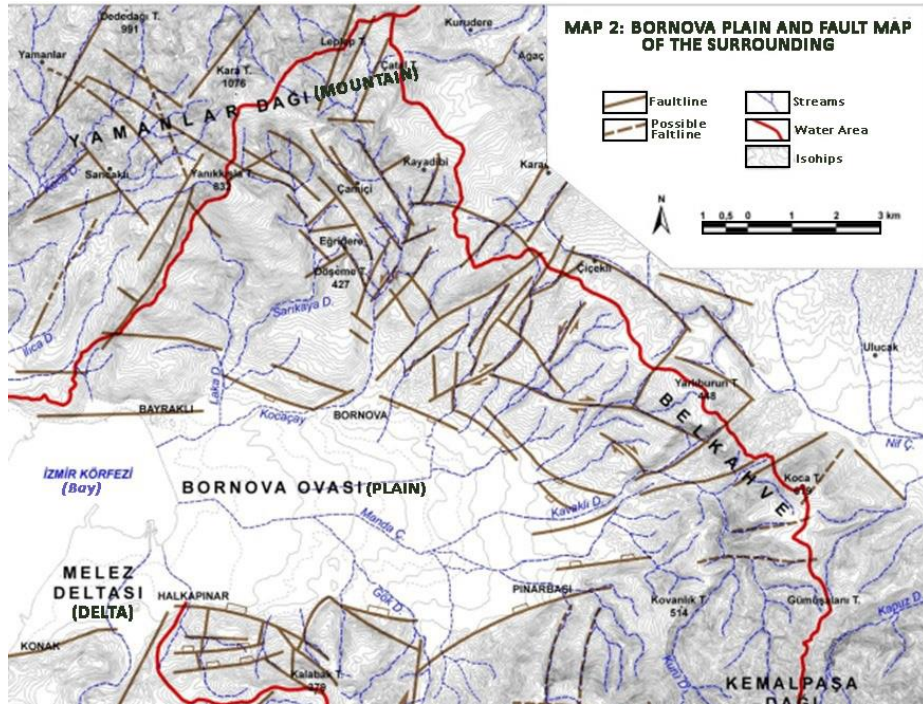


Figure 36. Fault Map of BornoVA Plain

Source: (Karadaş 2012)

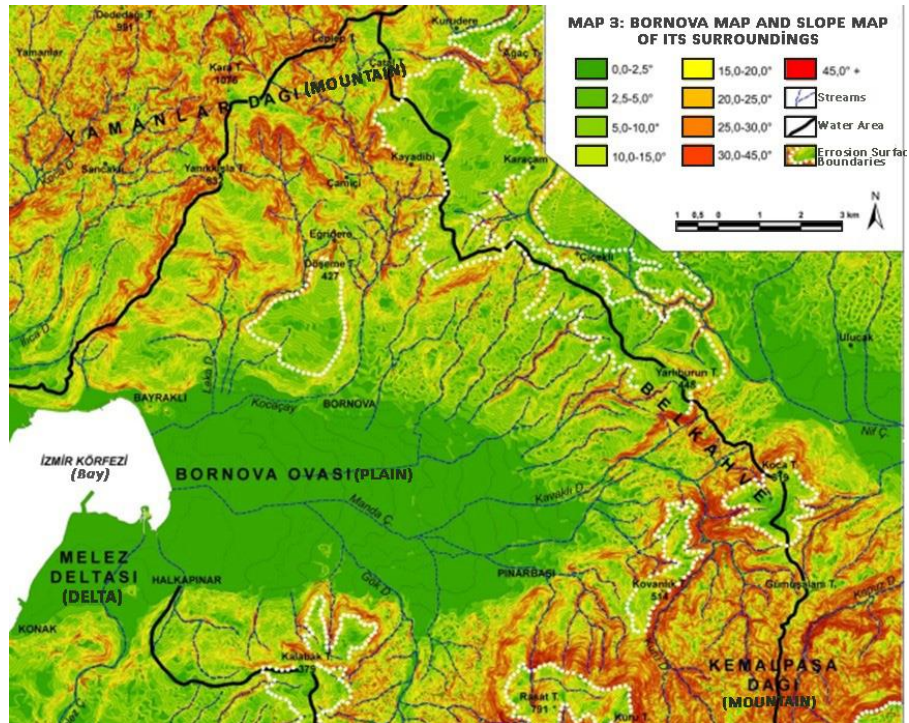


Figure 37. Slope Map of BornoVA Plain

Source: (Karadaş 2012)

Although the study area, consists of quaternary deposits, surrounds by riverbeds, the coastline was changed by filling in (Figure 38). Heavy damaged and destructed structures partially overlap with this filled coastal area.

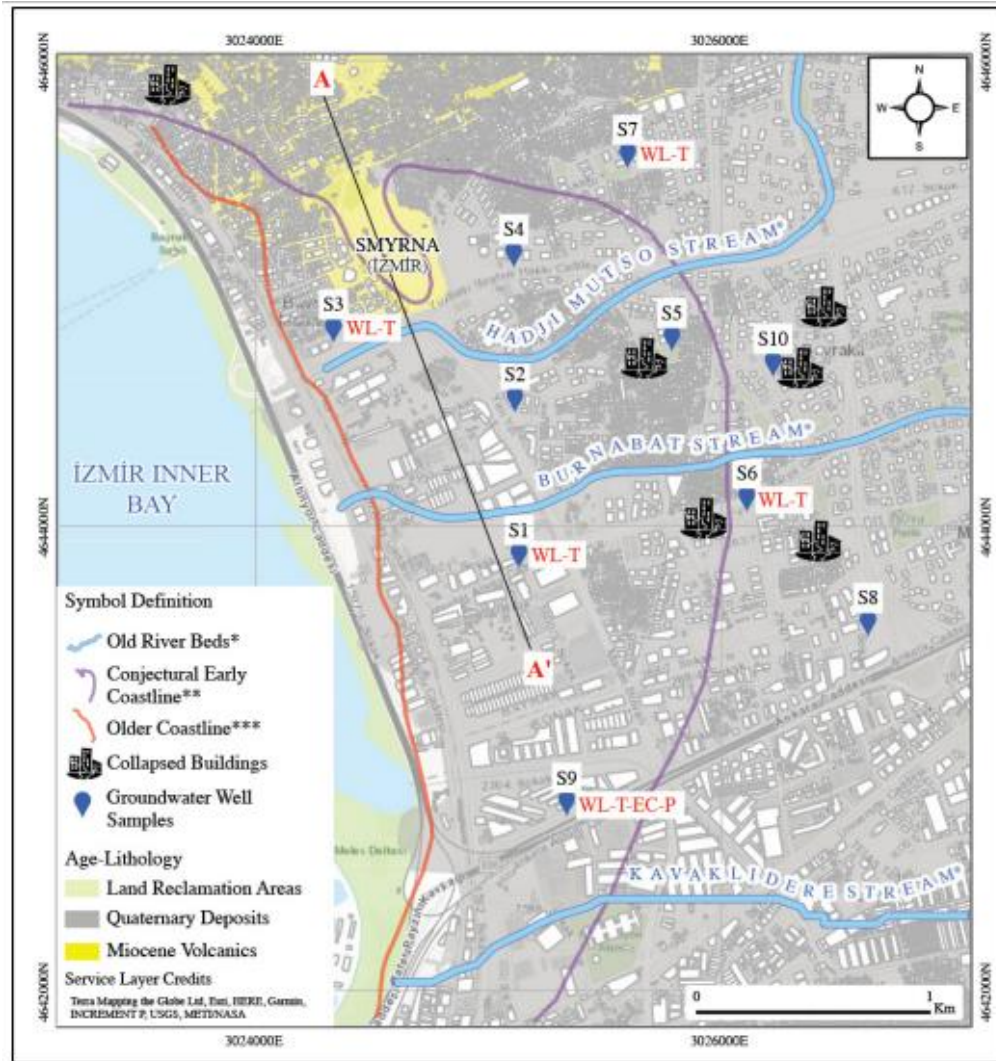


Figure 38. Sub-scale Geological Map of the Study Area

Source: (Uzelli et. al. 2021)

5.4.1. Planning History of the Study Area

The first city plan of İzmir in the republican period is prepared in 1925 by Danger and Prost. It does not include the Bayraklı district, is limited to fire areas and their

surroundings which is the centre including Alsancak, Konak and Karataş. However, this plan is important as it lays the groundwork for Bayraklı's development. The first plan including Bayraklı is Le Courbusier's plan in 1949. This plan made because of the increasing mobility of the city, population growth, spatial expansion, and the emergence of squatters. But it could not be implemented because of the World War II (İzmir Metropolitan Municipality Archives Plans and Reports; Kaya 2002).

The first implemented plan of study area is Aru, Özdeş and Canpolat's Competition Project Plan, in 1955. With this plan, the development of roads, factories, warehouses, and port caused the city to expand towards Halkapınar and Bayraklı. In the plan, improvement of Alsancak port, being surrounding of the port (Bayraklı) an industrial zone, development of new neighbourhoods in Buca and Bayraklı suggested. But it was insufficient due to the fact that the population growth rate was much higher than predicted. Thus, Albert Bodmer's plan was made in, 1960. This period fitted planned development approach. Foundation of planning education were laid and, legal and institutional ground changed. The plan was drawn according to the borders that the city will expand during the metropolitanization process, not the existing ones. Industrial areas, residential areas and green areas were proposed in the area covering the study area with foresight of Bayraklı's expansion. Industrial and residential development axes and the main transportation links defined. But is could not be implemented because of the military intervention in 1960 (İzmir Metropolitan Municipality Archives Plans and Reports; Kaya 2002).

After 1960, new planning institutions and departments were established. İzmir started to become a metropolitan city. Squatter problems increased rapidly. Population growth became unpredictable. Thus, the new plan was prepared for 5 years in order to adapt to the rapid change and metropolitanization process in 1973 by Metropolitan Planning Department. Improving squatters and preventing the formation of new squatter areas were aimed in the plan. Infrastructure services were highlighted (İzmir Metropolitan Municipality Archives Plans and Reports; Kaya 2002).

At the meeting held in 1978, the 1/50.000 scaled physical macroform of the İzmir Metropolitan City-wide was approved by the İzmir Master Plan Bureau. In these macroform decisions, a part of İzmir's Central Business Area remains within the borders of Bornova Municipality (1979 Plan Report, Bornova Municipality). Accordingly, in 1979, a 1/5000 scale master development plan was prepared by the Ministry of

Development and Housing. The plan includes decisions on density, services (school, trade, cultural, green space) and main transportation systems. In the plan annotations, implementation of earthquake regulation conditions emphasized. However, this was insufficient because, there was no ground survey for planning (Bayraklı and Bornova Municipality Interviews). Details of the plans showed in Appendix 9.

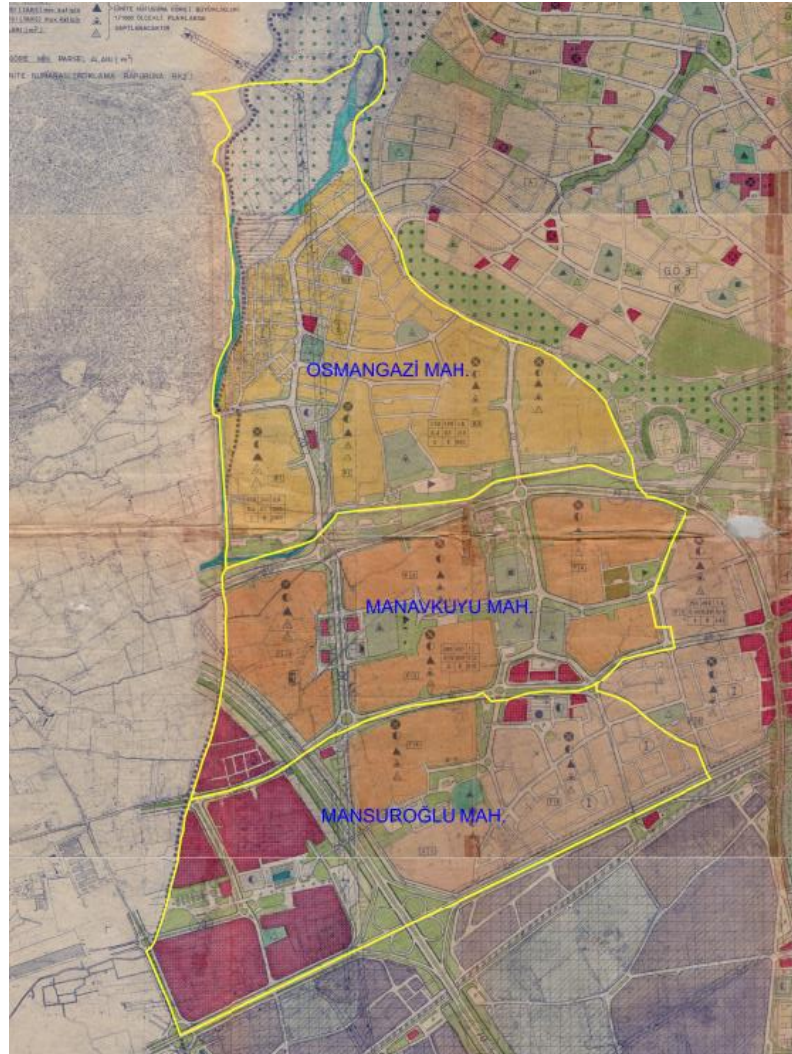


Figure 39. 1979 Approved 1/5000 Scaled Master Plan

Source: (Bornova Municipality Archives)

After 1980, the planning authority was taken from the municipalities. Then, for the study area, 1/1000 complementary development plan was prepared in 17.09.1980 by

the Ministry of Public Works and Housing and revised in 15.01.1982, 17.08.1983. However, these revisions are fragmentary. No building block-based, regional, or neighbourhood-based revision studies were carried out. The absence of ground surveys based on planning, for earthquake were also valid for these plans (Bornova Municipality Interviews). In addition to these revisions, Bayraklı-Çınarlı Implementation Plan, approved on 26.09.1983, is the first elementary development plan of the region it covers. The 8-storey construction requirement includes residential and non-residential urban employment area decisions (Adalet and Manavkuyu Neighbourhoods 1/1000 Scaled Revision Implementation Plan Report, Bayraklı Municipality 2022).

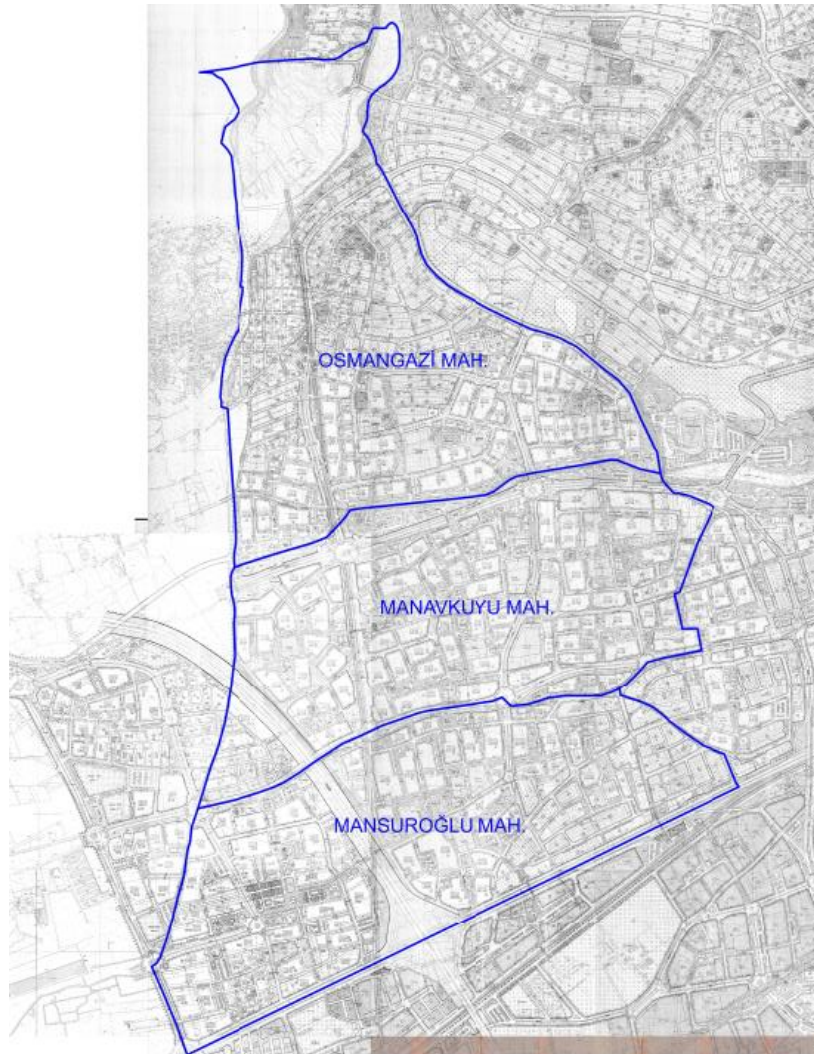


Figure 40. 1980, 1982, 1983 Approved 1/1000 Scaled Implementation Plan

Source: (Bornova Municipality Archives)

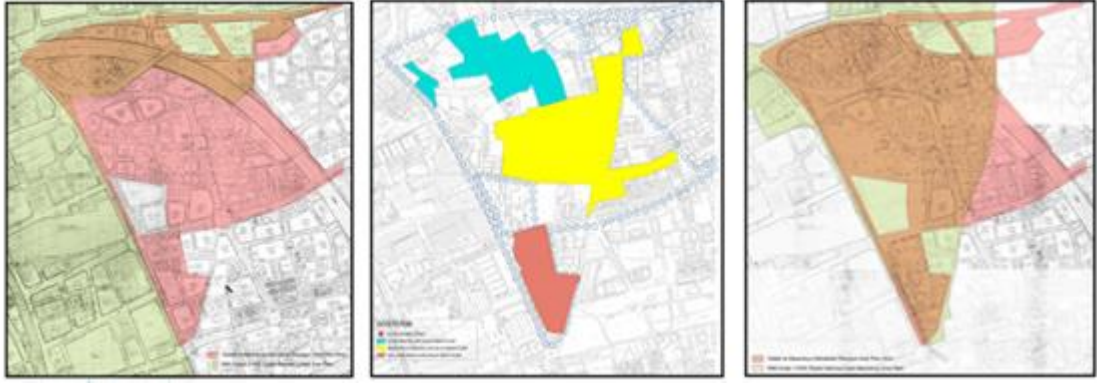


Figure 41. 1983 Approved 1/1000 Scale Bayraklı-Çınarlı Implementation Plan, 1986 Approved Rehabilitation Plans and 1988 Approved Salhane-Çiçek-Manavkuyu Revision Implementation Plan

Source: (Adalet and Manavkuyu Neighbourhoods 1/1000 Scaled Revision Implementation Plan Report, Bayraklı Municipality 2022)

There were large unplanned parcels because of after 1983 there were fragmentary plans. And these were used as residential or green areas. In 1985, Zoning Amnesty practices started. And rehabilitation plans were made in 1986 in order to prevent illegal construction, especially for these areas. On 30.05.1986 Salhane District Rehabilitation Plan and 06.01.1986 Manavkuyu District Rehabilitation Plan were approved. Arrangements were made regarding the property texture in the plans. Then, 1/1000 scale Salhane-Çiçek-Manavkuyu Revision Implementation Plan was approved by İzmir Metropolitan Municipality on 11.07.1988. In this plan, the property texture formed with the 1986 plan, was preserved (Adalet and Manavkuyu Neighbourhoods 1/1000 Scaled Revision Implementation Plan Report, Bayraklı Municipality 2022).

Investment demands, decisions and practices caused a need of revision on the 1973 plan decisions. Thus, 1/25000 scaled İzmir Metropolitan Master Plan Revision was made in 1989. However, it lost validity in 2002, because metropolitan municipalities did not have preparing and approving plan authority at that scale, in this period. Decisions about property regulations also continued in 1989 plan. These decisions were about building-parcel relationship, construction foundation (obligation of bedrock placed foundation), construction type in multi-storey structures (obligation of construction type

determining according to the soil safety stress), 1st degree earthquake zones (obligation of the earthquake regulation as basis for constructions in these areas).

In 1990, Bornova Highway Revision Plan was approved by the Izmir Metropolitan Municipality. The highway route, which includes in 1980 and 1983 Bornova Implementation Plans' decisions, was taken out of Bornova district's borders. Thus, with this plan previous highway route and its surroundings were rearranged. Then, in 1996 Bornova-Ankara Highway Trumpet Junction and Surrounding Master Plan was approved by Izmir Metropolitan Municipality. The master plan decisions of the Manavkuyu District and a part of the Adalet District were also revised with this plan.

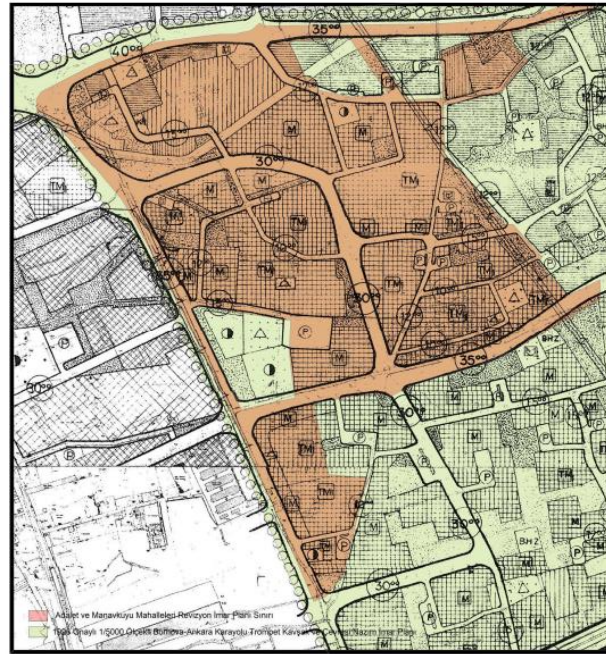


Figure 42. 1996 Approved, 1/5000 Scaled Bornova-Ankara Highway Trumpet Junction and Surrounding Master Plan

Source: (Adalet and Manavkuyu Neighbourhoods 1/1000 Scaled Revision Implementation Plan Report, Bayraklı Municipality 2022)

Izmir Metropolitan Municipality evaluated a project that received degree of an international urban design competition and combined with the existing data. Thus, a 1/5000 scale New City Centre Master Plan for the region was produced in 2003. Basic

approach of the plan was that the region had great potential. And its aims were creating a new city centre, integrating the two sides of the city, accelerating the development of the city, and improving the appearance and quality of life of the city with new strategies in plan decisions. In "Turan" region activities based on tourism, in "Salhane" business areas, public buildings, shopping, and entertainment facilities, in "Alsancak Port and its surroundings" historical-industrial areas were defined.

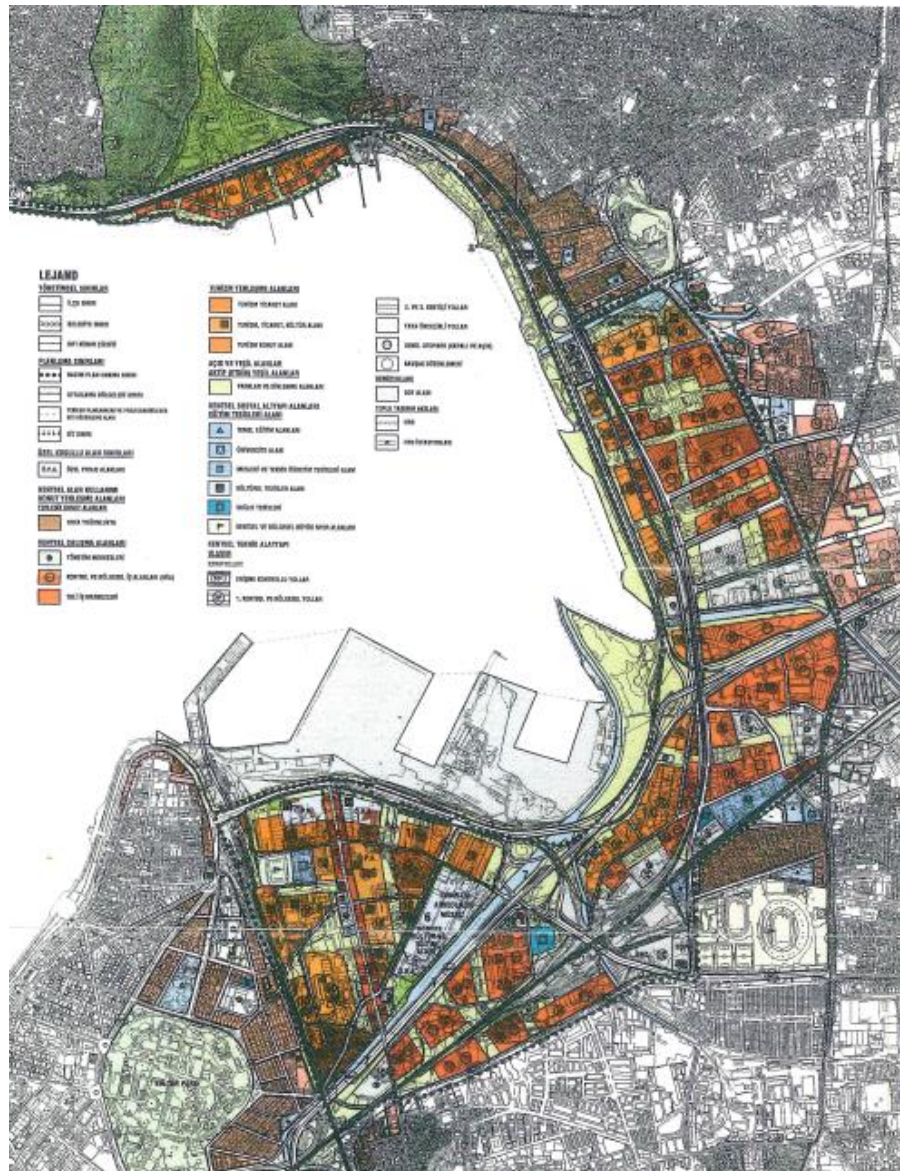


Figure 43. 2003 Approved 1/5000 Scale İzmir New City Centre Master Plan

Source: (İzmir New City Centre Master Plan Report, İzmir Metropolitan Municipality 2003)

In the plan annotations, observing the lowest ground tension as basis was mandatory. However, in the geological survey sheet based on the plan, the case area determined mostly as alluvial ground (Figure 44). And "alluvial ground is not resistant to earthquakes, has low bearing capacity and is unfavourable for construction. For structures to be built on a ground with these features, engineering projects in accordance with the determined properties of the ground are needed" (Bolat et. al. 2012). In addition, as the storey height increases, the possibility of liquefaction and earthquake risk increases, therefore the plan annotations will not reduce the existing risks in the Bayraklı and Salhane region (Erdik and Kaplan 2009).

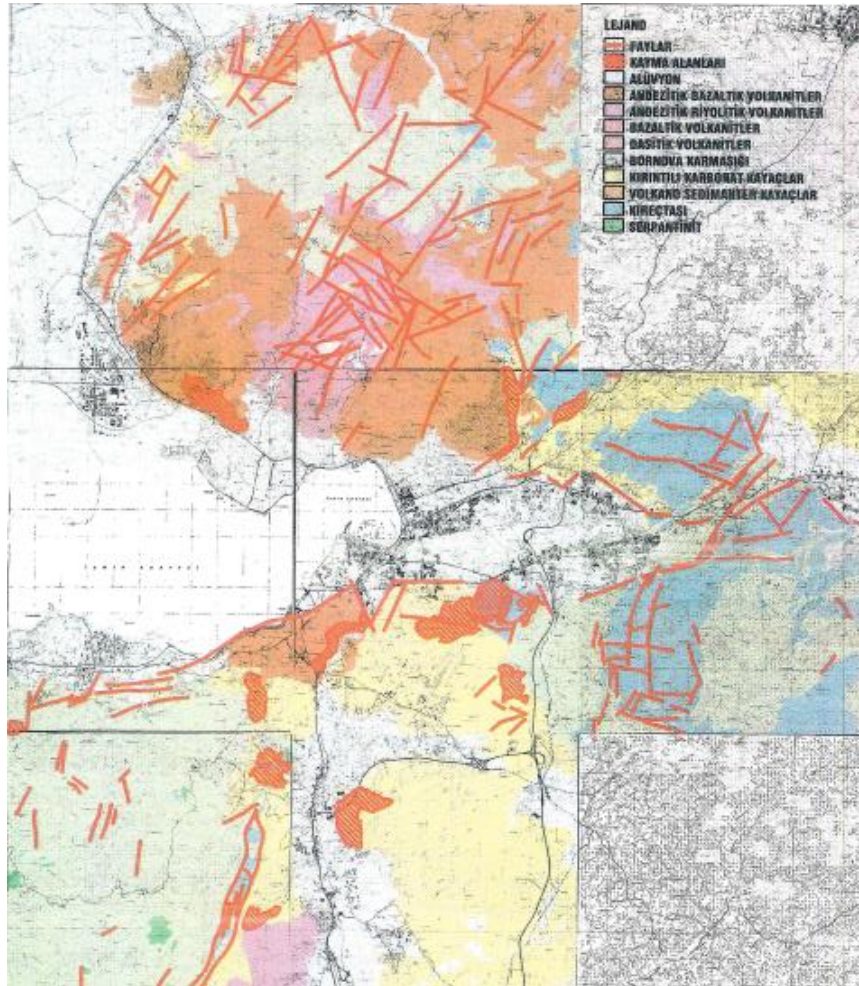


Figure 44. Geological Survey Based on 2003 Approved 1/5000 Scale İzmir New City Centre Master Plan

Source: (İzmir New City Centre Master Plan Report, İzmir Metropolitan Municipality)

There were difficulties in the implementation of the strategies determined by the plan, and as a result, the plan criticized in terms of generally focusing on building precedent increase and ownership structure in order to provide attractive conditions for investors and leaving the predictions in background (Erdik and Kaplan 2009). The earthquake hazard was not given sufficient importance in the plan and no earthquake scenario was produced. Although ground data detailly stated in geological studies, the plan was not guiding in terms of density and building heights according to these data. The region was declared as new city centre even though it is known unsuitable conditions of the ground for settlement, carrying high risk, potential to cause damages in an earthquake.

Based on the natural, ecological, and geological characteristics of the region, constraints definitions and limiting conditions for constructions should have been done. However, today, on the contrary, there are skyscrapers in the area close to the coast. The coast and some stream beds are filled. There are buildings rising up to 40 floors in the area designated as CBD. In summary, in this plan, geoscientific data were not adequately matched with spatial planning, earthquake risk was not included in the plan decisions such as density, height, etc.

Bayraklı became a district in 2008, pursuant to the law No.5747 (Presidency of the Turkey Republic 2020). And Bayraklı Municipality made implementation plans for the first time in 2011. 1/1000 Scaled New City Centre, Bayraklı-Salhane-Turan Region Implementation Plan approved in 18.03.2011. It is mostly still in effect. Plan annotations in terms of earthquakes are as follows (Appendix 10):

- Will observed to 2007 Earthquake Regulation.
- Will observed to issues in the geological and geotechnical survey report based on the zoning plan approved by AFAD.
- Preparing ground survey report and determining all ground parameters along with geotechnical calculations is mandatory. (Also taking into considerations points during ground survey were underlined)
- There are ground growth, liquefaction, softening, and related ground subsidence problems. Details regarding the foundation will be determined by the geotechnical report.
- Buildings will be designed by considering the structure-ground relationship with neighbouring parcels, and ground reinforcement will be made if necessary.

- The region consists of areas that will be affected by a possible earthquake.
- Observing technical recommendations determined by Izmir Metropolitan Municipality High-Rise Inspection Board are mandatory.

However, these are also not enough to reduce possible earthquake damage. Although “the region consists of areas that will be affected by a possible earthquake” annotation is included in plan, there is not a determination regarding earthquake risk zones. Also, there are not infrastructural or regional decision regarding on disasters, and measures are generally structure-based.

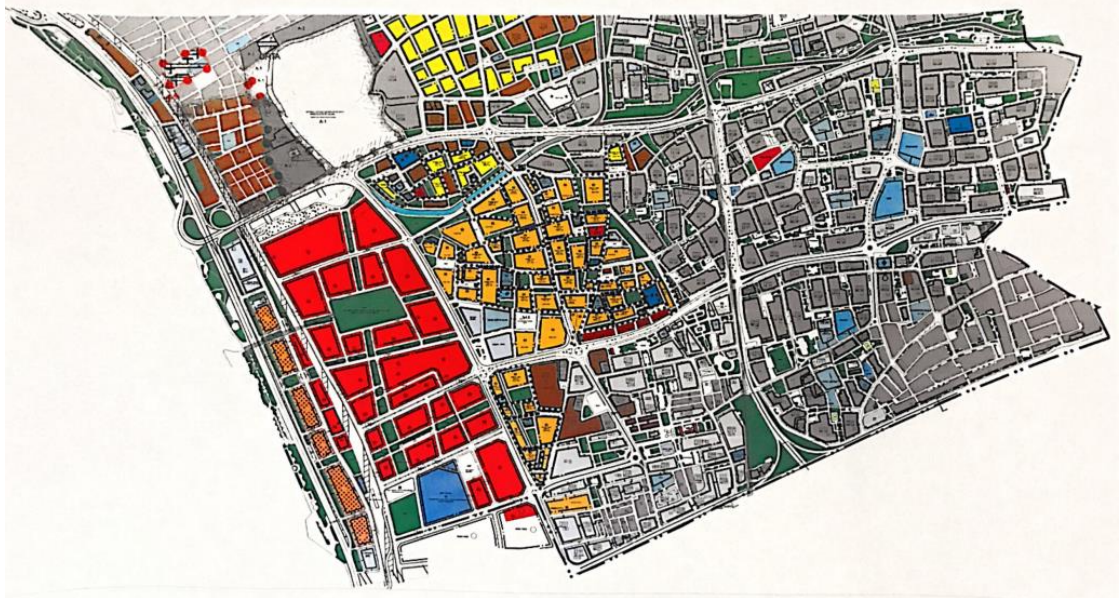


Figure 45. 1/1000 Scaled Current Implementation Plan

Source: (Bayraklı Municipality Archives)

Then in 2004, a 1/25000 scale Plan was prepared by the Izmir Metropolitan Municipality and approved in 12.09.2012. This plan is still in effect today. It covers the entire jurisdiction of the Izmir Metropolitan Municipality. Geological map, shown in Appendix 9, was used as the basis for the plan. Provisions for disasters in the plan annotations was explained in Chapter 5 (5.2.3., (7)). The case study area is determined as 2nd and 3rd Degree Centres (M) and residential area in this plan. In the plan

implementation provisions, 2nd and 3rd Degree Centres are centres specializing to serve resident population within their own interaction area of the settlements, including service, trade, tourism functions, smaller companies, office buildings and residential uses, and relating strongly with CBD. In annotations, there is a provision about sub-scale plans in terms of determination of detailed structuring conditions identical to the functions mentioned above. Also with the plan, the ancient city of Smyrna, is determined as an Archaeological Site. And a city hospital is decided n the north of İzmir Çanakkale highway.

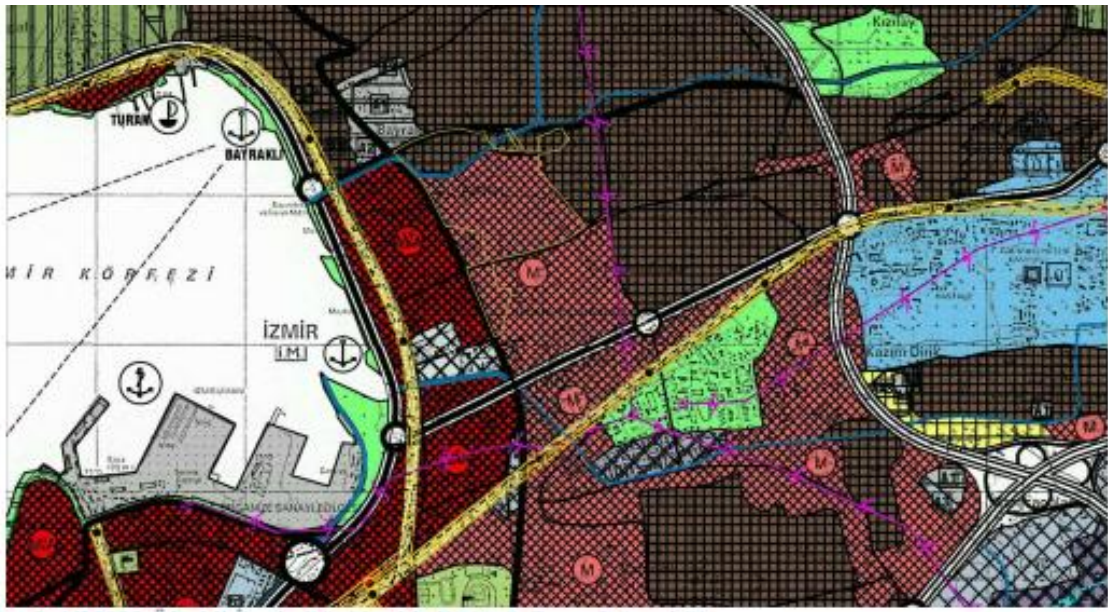


Figure 46. 1/25.000 Scaled İzmir Metropolitan Environmental Plan

Source: (Bayraklı Municipality Archives)

On 30.12.2014, İzmir-Manisa 1/100.000 scale Environmental Plan was approved by the Ministry of Environment and Urbanization. This plan is still in effect. The study area is determined as the "Urban Settlement Area" in this plan (legend of the plan is in Appendix 11). According to the plan implementation provisions, functions of urban settlement areas are residential, commercial educational and health facilities, indoor and outdoor sports areas, green areas, public and institutional facilities, social and technical infrastructures such as transformer, small industrial sites, touristic facilities.



Figure 47. 1/100.000 Scaled İzmir Metropolitan Environmental Plan

Source: (Bayraklı Municipality Archives)

In 02.11.2015, geological and geotechnical survey report covering the study area was approved by the Ministry of Environment and Urbanization (Adalet and Manavkuyu Neighbourhoods Master Plan Revision Report, 2022). According to this report, the case area is defined as precautionary areas in terms of liquefaction hazard (Figure 50).

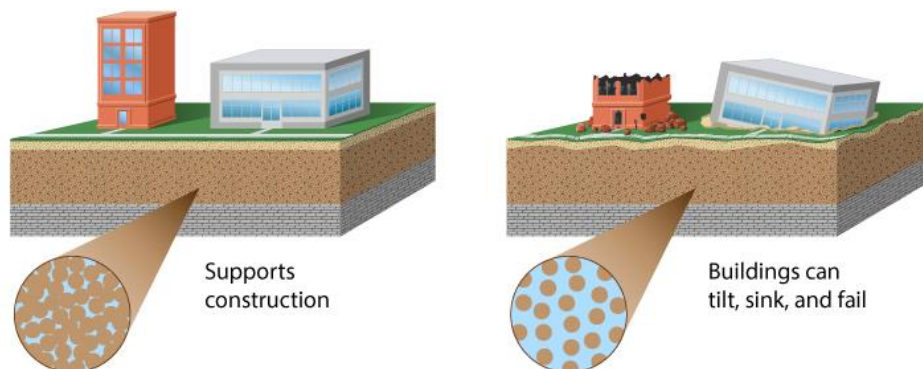


Figure 48. Soil Liquefaction Effects to Constructions

Source: (SwRI 2018)

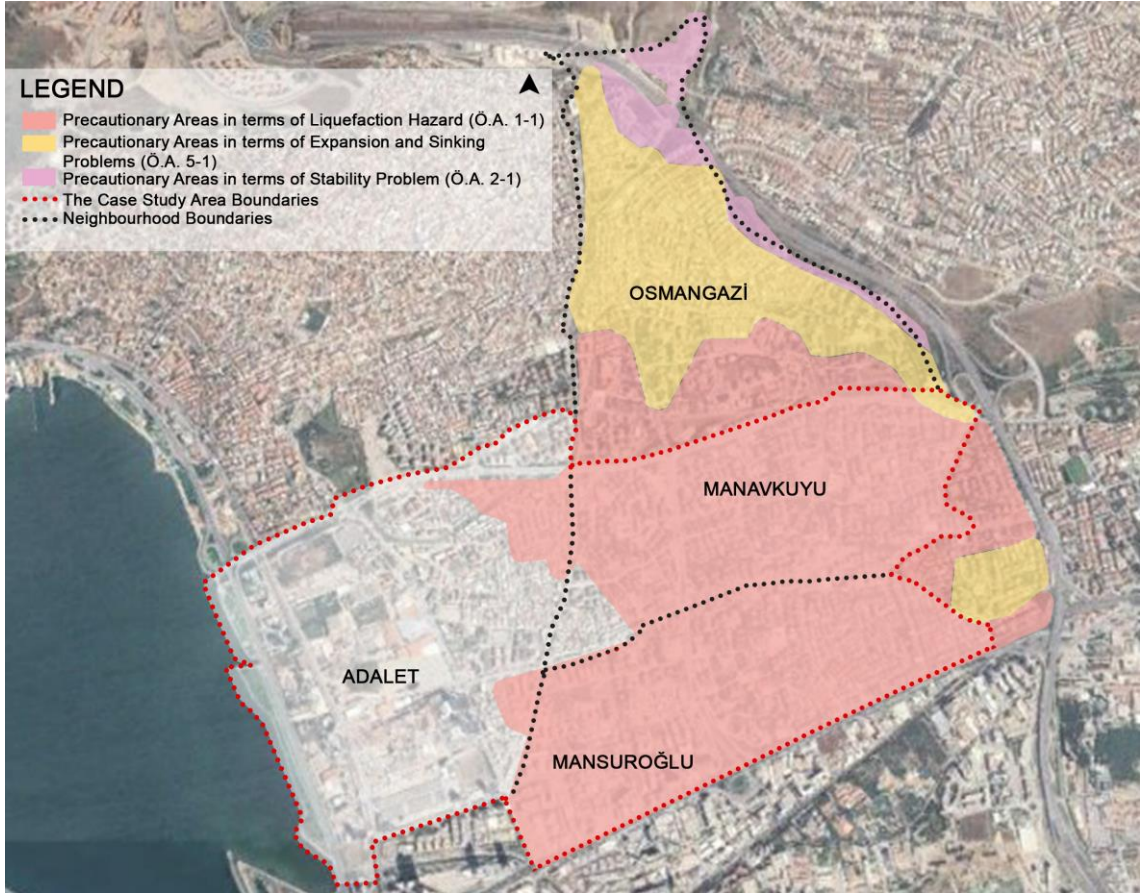


Figure 49. Settlement Availability Map

Source: (Data from Bayraklı Municipality, Visualized by Author)

According to report of 1/5000 scale Revision Master Plan for Reserve Building Area, with the 1/25,000 Izmir Metropolitan Municipal Environmental Plan amendment on 25.11.2020, a region affected by the earthquake was determined as an "urban development area", and on 30.11.2020, the same region was determined as a "reserve building area" by the Ministry of Environment and Urbanization, on 16.12.2020 again it was determined as an "urban development area" in 1/100000 scale Environmental Plan. Thus, with the approval of the Forest Cadastre Directorate on 02/06/2021, the area was taken out of the forest boundaries. Main purpose was providing social housing or at least temporary accommodation opportunity to exposed people. The reserve building area covers an area of approximately 375 ha and is based on clause (c) of article 2 of law no. 6306. It is outside the neighbourhood boundaries determined within the scope of this thesis.

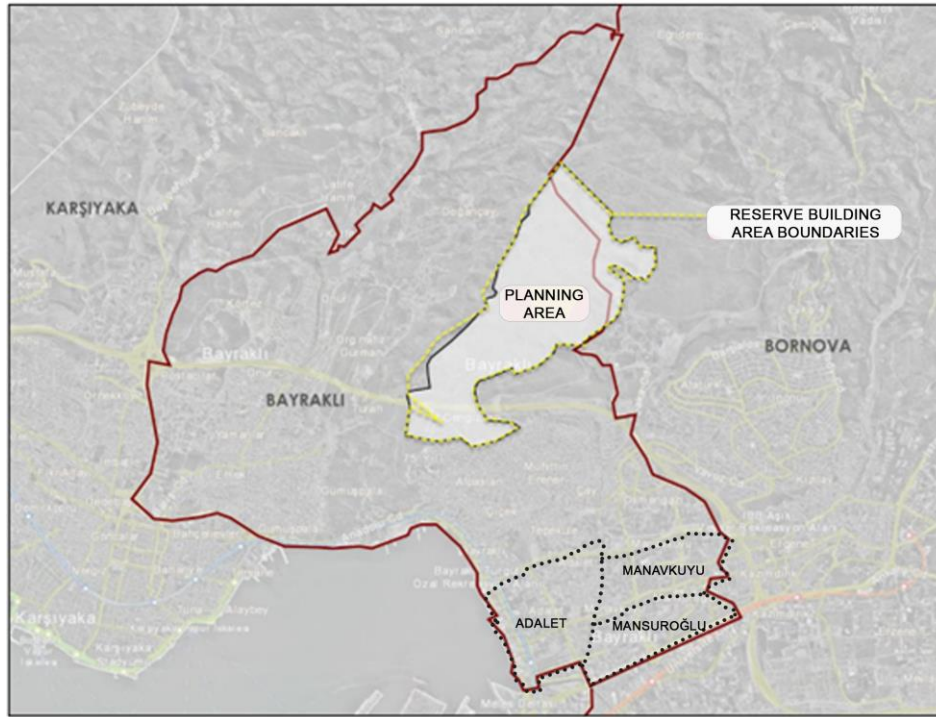


Figure 50. Boundaries of Reserve Building Area

Source: (Report of 1/5000 scale Revision Master Plan for Reserve Building Area)

In 27.04.2022, 1/1000 Scaled Adalet and Manavkuyu Neighbourhoods Master Plan Revision prepared by Bayraklı Municipality and approved by İzmir Metropolitan Municipality. This revision is important because it was approved after 30.10.2020 earthquake. And it is still in effect. Although 96% of the construction is completed in the planning area, the aim of the plan is transforming the region into a quality and healthy environment, providing equal conditions, solving, and implementing the infrastructure facilities with the least cost. It covers approximately 80 hectares. The risk of liquefaction and lateral spreading during the earthquake was highlighted of the area, in the plan report. Determination of objectives and targets for urban renewal and carrying out analysis and synthesis studies to form a basis for the plan was mentioned in order to create robust, sustainable, accessible, liveable, healthy, and safe urban spaces against earthquake risk. According to this purpose, plan implementation provisions and plan decisions that will ensure the transformation of the area was created, and changes were made regarding FAR (floor area ratio) and construction conditions. These changes are especially in the regions where rehabilitation work was done before.

Since the legal process regarding the region continues after the earthquake, the results have not yet been observed in terms of the applicability of the plan. However, an important issue mentioned in the plan report is that the areas that were destroyed after the earthquake were removed from the study area and included in the Project area of the Ministry of Environment and Urbanization. This situation negatively affects the integrity of the plan. Problems experienced in terms of authorities and actors in the plan processes are encountered.



Figure 51. Adalet and Manavkuyu Neighbourhoods 1/1000 Scaled Revision Implementation Plan

Source: (Plan Report, Bayraklı Municipality, 2022)

Table 20. Planning History of the Study Area

DATE	PLAN	SCALE	INSTITUTION
1949	Le Corbusier Plan	CITYWIDE	Ministry & İzmir Municipality
1955	Aru, Özdeş and Canpolat's Competition Plan	CITYWIDE	Competition project, İzmir Municipality
1960	Albert Bodmer Plan (<i>did not implemented</i>)	CITYWIDE	Ministry of Development and Housing
1973	5 Years Development Plan	CITYWIDE	İzmir Metropolitan Planning Department, Ministry of Development and Housing
1978	Izmir City Entire Macroform Decisions	1/50.000	Izmir Master Plan Bureau
18.06.1979	Bornova Master Plan	1/5000	Ministry of Development and Housing
17.09.1980	Bornova Implementation Plan	1/1000	Ministry of Public Works and Housing
15.01.1982	Bornova Implementation Plan Revision	1/1000	Ministry of Public Works and Housing
17.08.1983	Bornova Implementation Plan Revision	1/1000	Ministry of Public Works and Housing
26.09.1983	Bayraklı-Çınarlı Implementation Plan	1/1000	Ministry of Public Works and Housing
30.05.1986	Salhane Rehabilitation Plan	Partial Plan	Ministry of Public Works and Housing
06.01.1986	Manavkuyu Rehabilitation Plan	Partial Plan	Ministry of Public Works and Housing
11.07.1988	Salhane-Çiçek-Manavkuyu Revision Implementation Plan	1/1000	İzmir Metropolitan Municipality
1989	Metropolitan Municipality Plan	CITYWIDE / 1/25000	Izmir Metropolitan Municipality
24.08.1990	Bornova Highway Revision Plan	1/1000	Izmir Metropolitan Municipality
17.09.1996	Bornova-Ankara Highway Trumpet Junction and Surrounding Master Plan	1/5000	Izmir Metropolitan Municipality
2003	İzmir New City Centre Master Plan	1/5000	Competition project, İzmir Metropolitan Municipality
18.03.2011	New City Centre, Bayraklı-Salhane-Turan Region Implementation Plan	1/1000	Bayraklı Municipality
12.09.2012	İzmir Metropolitan Environmental Plan	CITYWIDE / 1/25000	İzmir Metropolitan Municipality
30.12.2014	İzmir-Manisa Planning Region Environmental Plan	REGIONAL / 1/100.000	Ministry of Environment and Urbanization
27.04.2022	Adalet and Manavkuyu Neighbourhoods Master Plan Revision	1/1000	Bayraklı Municipality, İzmir Metropolitan Municipality

CHAPTER 6

RESULTS AND CONCLUSION

After the 1900's, instrumental period began. Thus, earthquakes were measured by seismographs. With the republic, efforts were on building of the modernist nation state. After independence war, cities were damaged, and post-disaster rehabilitation processes started. İzmir was one of these cities. With establishment of Ministry of Development and Housing, urban planning became mandatory. In 1925, first plan of republican period for İzmir was made for fire damaged areas. It did not include the case study area. Municipalities were given the authority to expropriate in 1934. Legal frame related to disasters was developed specialized on the type of disaster and the region affected by the disaster until 1944. Law in 1944 was beginning of earthquake risk management studies in Turkey. First time measures before earthquakes were determined for central government. These were determination of earthquake zones and need for new buildings, making necessary ground surveys, preparation of aid and rescue programs. Based on this law, first earthquake map of Turkey was created in 1945. Same year Ministry of Public Works was established. In 1947, first earthquake regulation came into force. With this regulation, construction conditions according to the regions on the map were described and the map also revised. In 1949, Le Corbusier prepared a plan for İzmir. It was the first plan to include Bayraklı district. Although there was a law regarding pre-earthquake measures, an earthquake map and an earthquake regulation, the plan focused on solutions to population growth and squatter problems rather than earthquakes. It could not be implemented because of the World War II. Although it was not implemented due to the dynamics in the world, existing geoscientific data should have reflected in the plan, even

at upper scale. A foreigner planner caused a departure from the existing legal framework. The existing authority should have managed and have been involved in the decision-making process. In this respect, laying the foundations of planning education was a positive development.

In 1953, the earthquake regulation revised and Earthquake Bureau under the Ministry of Public Works was established for mitigation of disasters' negative results. In 1955, Aru, Özdeş and Canpolat's Competition Project Plan was approved. It was the first implemented plan of study area. It caused important development and growth to Bayraklı. Although the planners were non-foreign, there were the same problems in this plan as in the Le Corbusier Plan. There was a law regarding pre-earthquake measures, an earthquake map, an earthquake regulation and also an Earthquake Bureau. The plan could be prepared in cooperation with the bureau. However, this plan focus was on development, too. The competition project should have revised according to the requirements of the law regarding the measures to be taken before the earthquake, before approved by the municipality. However, the geoscientific data, the regulation and the law were not reflected in the plan. A crucial law came into force 1 year after the approved plan, in 1956. It was the first planning law (No. 6785) determining of new settlements considering natural hazards and providing building control. In 1958, Ministry of Development and Housing was established. Disaster-related duties determined for the ministry. Same year, first comprehensive disaster law came into force. Disaster fund was created, search-rescue and first-aid principles, organization, duties, responsibilities of civil defence in emergencies were determined with this law. Duties, such as pre-disaster and post-disaster measures, national plans, solution of housing problem, shifted from Ministry of Public Works to Ministry of Development and Housing totally, with Law No.7269, in 1959. Despite all of these, the plan was not revised. And it was insufficient due to the fact that the population growth rate was much higher than predicted.

After 1960's, works on disasters increased both in the world and in Turkey. Albert Bodmer prepared a plan for İzmir in 1960. The expansion of Bayraklı were predicted in the plan, however it could not be implemented because of the military intervention. Same year, State Planning Organization was established, thus, planned development model was adopted. In 1961, earthquake regulation was revised, first department of planning was established. Then, Turkey Earthquake Zones Map revised, metropolitan planning offices and General Directorate of Disaster Affairs was established. In 1968, format of disaster

preparedness and response activities regulated. In 1972, Turkey Earthquake Zones Map revised, earthquake fund created and ministry was given the authority to plan above the municipalities. The provision, first preparing a plan by the ministry in order to ensure the plan hierarchy and to reflect the holistic approach in spatial plans into practice, came into force. However, in 1973 a plan for 5 years was prepared, before ministry. Improving squatters and preventing the formation of new squatter areas were aimed in the plan. Infrastructure services were highlighted. It was a positive development in terms of reducing vulnerability to disasters. However, legal requirements such as ground survey were still not fulfilled. And it lost its validity in 2003 based on the law numbered 3194 (Izmir Metropolitan Municipality Plan Report 2022).

Then in 1975 earthquake regulation revised again. And, in 1978, the 1/50.000 scaled physical macroform of the Izmir Metropolitan City-wide was approved by the Izmir Master Plan Bureau. In this macroform decisions, most of the study area was in Bornova district. And the 1995 population of Bornova was determined as 210,000. Expansion of the university area was proposed. Growth in the western direction was envisaged. Thus, in 1979, a subscale, 1/5000, master development plan was prepared by the Ministry of Development and Housing. In this plan, the population density in residential areas was determined as 300 people/hectare. Decreasing the population density in the eastern and southern directions was predicted. The average housing unit size was determined as 100 m². Total of 637.47 hectares (ha) proposed as residential, 35.7 ha as commercial, 52 ha as industrial, 191.05 ha as green, 45.08 ha as educational space, 291.25 ha as university, 10.5 ha as cultural and social, 2.1 ha religious and 2.31 ha as health facilities (Plan Report, Bornova Municipality Archives) (Appendix 9). In the plan annotations, implementation of earthquake regulation conditions emphasized. However, again, legal requirements were still not fulfilled. There were not ground survey, geoscientific data were not included in the decision-making process.

1980 was a breaking point both in national and international level. Globalization began, internet spread. There was a military intervention in Turkey. First 1/1000 scale implementation plan prepared for the case area. It was based on macroform decisions and 1/5000 scale plan. It was revised in 1982, 1983 and 1986 fragmentary. Construction conditions was eight-storey mostly. The absence of ground surveys based on planning, for earthquake were also valid for these plans. Again, earthquake-related precautions required by regulations and laws were not reflected in spatial plans. In 1983, first time

disaster described as an emergency state, and Ministry of Public Works and Settlement was established. In 1984, TOKİ was established. With planning law in 1985, local governments were authorized for the preparation and execution of master plans. UN determined 1990-2000 as international decade for natural disaster reduction, and published a international framework of action in 1989. Same year, because of the revision need of previous plan, 1/25000 scaled İzmir Metropolitan Master Plan Revision was made. It was the first plan based on 1985 planning act. However, it lost validity in 2002, because with law in 1985, metropolitan municipalities could not authority for preparing and approving at that scale. It could have been prepared using international developments as a guide.

In, 1994, I. World Conference on Natural Disaster Reduction was held in Yokohama, Japan. In 1995, basic disaster law revised again with law. First institution directly about disaster management, Prime Ministry Crisis Management Centre, established in 1997. Earthquake regulation revised in 1998. However, almost before it could find a place in practice, the Marmara Earthquake in 1999, one of the earthquakes that caused the most damage in the country, occurred. Radical and fundamental legal and institutional changes was made. Earthquake insurance became mandatory, regulations for private sector were made regarding the inspection of structures other than public buildings. Same year, UNISDR was developed and UNDRR was established. Again, same year, "RADIUS Project" was prepared by İzmir Metropolitan Municipality and Boğaziçi University and realized in 1999. Bayraklı was not involved in this project. From the earthquake scenarios created, Bayraklı's potential to receive serious damage and its high risk was revealed. In 2000, with establishment of General Directorate of Emergency Management of Turkey and National Earthquake Council, authorities and responsibilities regarding disasters became more complex. Then, in 2003, 1/5000 scale New City Centre Master Plan was prepared by Izmir Metropolitan Municipality. Both in the plan produced by the RADIUS project and in the geological research based on this plan, it was known that the region was at high risk, was not suitable for construction, had a high risk of liquefaction, consisted of alluvial ground, and was surrounded by fault lines. Despite this, attracting investors and development were the focus. Earthquake risk was ignored. Despite the availability of geological data and the approaches to disaster reduction offered by the legal framework, they were not reflected in the plan. In 2005, II. World Conference on Disaster Reduction was held in Kobe, Japan and Hyogo Framework for Action 2005-

2015 was developed. Same year, Seferihisar and Urla earthquakes were occurred and caused serious damage. Provincial Emergency Aid Plan Revision was made in cooperation with the institutions established in the previous period. İzmir Disaster Management Information System (İZAYBİS) was created. A project was developed, financed by İzmir Development Agency (İZKA) and aimed to increase the effectiveness of disaster management within the framework of the plan revision. This project was implemented until 2010. In 2007, earthquake regulation revised again and National Earthquake Council was closed. In 2008, Bayraklı became a district. First comprehensive institution about disasters, AFAD, was established in 2009. Thus, disaster related institutions merged in an institution. In 2011, Ministry of Environment and Urbanization was established and State Planning Organisation closed. At the same year, Bayraklı Municipality made implementation plans for the first time. It is mostly still in effect. It is not sufficient for a successful spatial planning in terms of earthquake risk management. Although "the region consists of areas that will be affected by a possible earthquake" annotation is included in plan, there is not a determination regarding earthquake risk zones. Also, there are not infrastructural or regional decision regarding on disasters, and measures are generally structure-based.

In 2012, Catastrophe Insurance Law and Law No: 6306 came into force. Same year, 1/25000 scale Plan was approved by Izmir Metropolitan Municipality. It is still in effect. Seismicity and earthquake hazard analysis were included in the plan report. The Geological Map of the General Directorate of Mineral Research and Exploration (MTA) was used as the basis for the plan (Appendix 9). According to plan annotations, it is mandatory to carry out geological, geotechnical, and geophysical studies in sub-scale plans, areas identified as having a high risk of liquefaction will not be permitted to construction, high-risk unbuilt areas will be used as green areas or reserve areas for temporary uses after the disaster, roads will be designed in a way that will not obstruct traffic flow after the disaster, public open spaces will be used as assembly areas in case of disaster. in sub-scale plans, disaster-related aid, management, support, intervention, and assembly areas will be determined according to the predicted population. However, these were not reflected in practice. Sub-scale plans that needed to comply with the upper-scale plans were not revised. Same situation was made again in terms of plan hierarchy with İzmir-Manisa 1/100.000 scale Environmental Plan. It was approved by the Ministry of Environment and Urbanization in 2014. This plan is still in effect, too. After all these

planning activities, in 2015, geological and geotechnical survey report covering the study area was approved by the Ministry of Environment and Urbanization (Adalet and Manavkuyu Neighbourhoods Master Plan Revision Report, 2022). However, the report only formalized risks that were already known. Same year, Sendai Framework for Disaster Risk Reduction 2015-2030 was developed by UN. Based on this international framework and other developments, plans should have been revised as prioritized to earthquake risk management. Turkey Earthquake Zones Map revised again 2018. Accordingly in 2019, earthquake regulation revised. In 2020 Samos earthquake caused serious damage and loss of life. Thus, 2021 declared the year of disaster education in Turkey. In 2022, 1/1000 scale implementation plan including case study area revised (The plan report could not be accessed).

In summary, in the planning studies carried out for the case study area until 1999, geoscientific data were at upper scale, but even these were not taken as a basis for the plans, geoscientific data at lower scale were not produced and earthquake-related decisions were not reflected in the decisions of plans, the legal framework for earthquake management was not included in the plans, actors remained inadequate in terms of supervision, implementation and cooperation. The 1999 Marmara earthquake significantly changed the perspective on disasters. In the RADIUS project, it was determined that the region was at high risk. However, this situation was not reflected in the earthquake master plan and the region was excluded from the scope of the plan. In the 2003 plan, although the risk was known, geological data was available, and the region was determined unsuitable for construction, high density and multi-storey construction conditions were recommended. Although the earthquake risk was emphasized in the 2011 plan, there was no determination of risk areas. There were no holistic decisions regarding the earthquake, and the measures remained on a structural scale. The 2012 plan included important decisions regarding earthquake risk management. However, these were not reflected in practice. Changes had to be made in the lower-scale plans that needed to adapt to the upper-scale plans. After the 2014 plan was approved, geoscientific data was produced by the same institution in 2015. This data should have been produced before the plan and should have been the basis of the plan. Or the plan should have been revised immediately afterwards. The 2020 plan should have been made comprehensively, not only for reserve area production, but also in accordance with the cyclical and holistic nature of disaster management, including the entire region affected by the earthquake.

Table 21. Comparison of Plan Studies and Legal Institutional Framework

Key Issues	Legal-Institutional Frame	Explanations	Planning Activities/Projects	Explanations, Critics & Suggestions	
- After 1900's earthquakes began to measure by seismographs "instrumental period" - 1923: Republic of Turkey - New form of planning	1923: Ministry of Development and Housing	Urban planning became mandatory.	1925: Danger and Prost Plan, by Municipality, citywide scale	It was for fire damaged areas, did not included the case area. The focus was rebuilt the city center, create modern city and nation. It was an example for post-disaster recovery approach in spatial planning.	
	1934: Municipal Expropriation Law No. 2722	Expropriate authority gave to municipalities.			
- 1945: End of the World War II - 1945: Transition from single-party system to multi-party system of Turkey - Planning perspective shifted from architecture's extension to multidisciplinary social science - First foundations for planning education - Planning was perceived as an "interdisciplinary profession"	1944: Law on Measures to be Taken Before and After Earthquakes No. 4623 "First law related with the earthquake risk management"	Measures before earthquakes were determined: earthquake zones & need for new buildings, making necessary ground surveys, preparation of aid & rescue programs.	1949: Le Corbusier Plan, by Ministry and Izmir Municipality, citywide scale	"First plan to include Bayraklı" There were legal obligations for earthquakes. There was earthquake zones map. However, the plan ignored them, focused on solutions to population growth and squatter problems. It could not be implemented because of the World War II. Existing geoscientific data should have been reflected in the plan. The existing authority should have managed and have been involved in the decision-making process.	
	1945: Establishment of Ministry of Public Works - "Creation of Turkey Earthquake Zones Map"	First Turkey Earthquake Zones Map was prepared (Appendix 2).			
	1947: Earthquake Regulation - Revision of Earthquake Zones Map	Construction conditions for the regions on the map were described. & (Appendix 3)			
	1953: Earthquake Regulation Revision - Earthquake Bureau establishment "First institution regarding earthquake"	It was established under the Ministry of Public Works, Construction and Zoning Affairs Directorate. The aim was reducing negative, destructive, harmful results of earthquakes.			
	1956: Planning Law No. 6785	First law determined of new settlements considering natural hazards & providing building control.			
	1958: Establishment of the Ministry of Development and Housing with Law No. 7116 - Civil Defence Law No. 7126 "First comprehensive disaster law"	Disaster-related duties determined for the ministry. Disaster fund was created, search-rescue and first-aid principles, organization, duties, responsibilities of civil defense in emergencies were determined.			
- 1960: Military intervention - UN works & organizations on natural hazards and disasters - Planning gained respect nationally - Necessity of economic and social dimensions in planning was understood - Need of planned development model (5-years development plans)	1959: Disaster Law No:7269	Duties shifted to Ministry of Development and Housing totally.	1955: Aru, Özdeş and Canpolat's Competition Plan, by Izmir Municipality, citywide scale	"First implemented plan of study area" It caused important development and growth to Bayraklı. Planners were non-foreign, however there were same problems as in the previous one. Its focus was development, too. Also, there was an Earthquake Bureau. It could be prepared in cooperation with the bureau. The competition project should have revised according to law and regulation. The geoscientific data, the regulation and the law were not reflected in the plan.	
	1960: State Planning Organization establishment	5 years development plans were prepared.			
	1961: Earthquake Regulation Revision - "First planning department in METU"	Planning education started for the first time in Turkey.	1960: Albert Bodmer Plan, by Ministry of Development and Housing, citywide scale	The expansion of Bayraklı were predicted in the plan, however it could not be implemented because of the military intervention.	
	1963: Turkey Earthquake Zones Map revision	(Appendix 4)			
	1965: Establishment of Metropolitan Planning Office & General Directorate of Disaster Affairs	These offices prepared master plans in metropolitan areas (İzmir, İstanbul and Ankara).	1973: 5 Years Development Plan, by Izmir Metropolitan Planning Department, citywide scale	It was prepared before the ministry. Aim was improving squatters and infrastructure services, preventing the formation of new squatter areas. It was a positive development in terms of reducing vulnerability to disasters. However, legal requirements such as ground survey were still not fulfilled. It lost its validity in 2003.	
	1968- Law No. 1051 - Regulation on Emergency Aid Organization and Planning Principles Regarding Disasters	Format of disaster preparedness and response activities regulated.			
	1972: Law No. 1571 - Turkey Earthquake Zones Map revision - Law No. 1605	1972: Law No. 1571	Earthquake fund was created. (Appendix 5)	1978: Izmir City Entire Macroform Decisions, by Ministry of Development and Housing, 1/50000	"First on this scale for Izmir" Most of the study area was in Bornova. 1995 population was determined as 210,000. Expansion of the university area was proposed. Growth in the western direction was envisaged. It was a positive development in terms of plan hierarchy. However, there were no decisions regarding disasters.
		1975: Earthquake Regulation Revision	Construction conditions for the regions revised based on new map.		
1979: Bornova Master Plan, by Ministry of Development and Housing, 1/5000 scale		It was based on macroform decisions. Population density in residential areas was determined as 300 pe/ha. Implementation of earthquake regulation conditions emphasized. However, there were not ground survey, geoscientific data were not included in the decision-making process.			
- 1980: Military intervention - 1981: "First use of "Resilience" - 1990-2000: Declaration of International Decade for Natural Disaster Reduction (IDNDR) & publication of International Framework of Action - 1993: EU establishment - 1994: I. World Conference on Natural Disaster Reduction	1983: State of Emergency Law No. 2935 - Ministry of Public Works and Settlement	Disaster described as an emergency state.	1980: Bornova Implementation Plan, 1/1000 scale, & Revisions in 1982, 1983, 1986 by Ministry of Public Works and Housing	Construction conditions was eight-stored mostly. The absence of ground surveys based on planning, for earthquake were also valid for these plans. Again, earthquake-related precautions required by regulations and laws were not reflected in spatial plans.	
	1984: Establishment of TOKİ with Mass Housing	Its aim was to meet the quality housing needs.			
	1985: Planning Law No. 3194	Local administrations were authorized for the preparation and execution of master plans.	1989: Metropolitan Municipality Plan, by Izmir Metropolitan Municipality, 1/25000 scale	"First plan based on 1985 planning act, a local planning effort" It lost validity in 2002, because with law in 1985, metropolitan municipalities could not authority for preparing and approving at that scale. It could have been prepared using international developments as a guide.	
	1995: Law No. 4133	Basic disaster law no 7269 amended for the third time. (Appendix 6)			
	1997: "First institution about disaster management" Establishment of Prime Ministry Crisis Management Centre	Its aim was least damage, coordination and cooperation with the relevant ministries, institutions, & organizations.	1998: Earthquake Regulation Revision	Construction conditions for the regions revised based on new map.	
	1998: Earthquake Regulation Revision	Construction conditions for the regions revised based on new map.			

<p>- 1999: Marmara Earthquake - 1999: United Nations International Strategy for Disaster Reduction (UNISDR) was developed & United Nations Office for Disaster Risk Reduction (UNDRR) was established -2005: II. World Conference on Disaster Reduction & Hyogo Framework for Action 2005-2015 - 2005: Urla-Seferihisar Earthquake - 2008: Bayraklı became a district - 2015: Sendai framework for disaster risk reduction 2015- 2030 - 2019: Covid-19 pandemic - 2020: Samos Earthquake - 2021: Declared the year of disaster education - 2023: Kahramanmaraş Earthquake</p>	<p>1999: Regulations after Marmara Earthquake</p>	<p>Council of Ministers was authorized for decree laws for a period of ten months: ensuring coordination between relevant institutions, establishment of safe new settlements, a new insurance system, new provinces, and districts in the exposed region. Earthquake insurance became mandatory. Regulations for private sector were made regarding the inspection of structures other than public buildings.</p>	<p>1999: RADIUS Project, by İzmir Metropolitan Municipality</p>	<p>İzmir Metropolitan Earthquake Master Plan was created. Although, from the earthquake scenarios, Bayraklı's potential to receive serious damage and its high risk was revealed, it was not involved in this project.</p>
	<p>2000: Establishment of the General Directorate of Emergency Management of Turkey & National Earthquake Council</p>	<p>Authorities and responsibilities regarding disasters became more complex.</p>	<p>2003: İzmir New City Centre Master Plan</p>	<p>It was known that the region was at high risk, was not suitable for construction, had a high risk of liquefaction, consisted of alluvial ground, and was surrounded by fault lines. Despite this, attracting investors and development were the focus. Earthquake risk was ignored. Despite the availability of geological data and the approaches to disaster reduction offered by the legal framework, they were not reflected in the plan.</p>
	<p>2007: Earthquake Regulation Revision - National Earthquake Council was closed</p>	<p>The first earthquake regulation after the Marmara earthquake.</p>	<p>2005: Provincial Emergency Aid Plan Revision, IZAYBIS, IZKA project</p>	<p>Aim was to increase the effectiveness of disaster management within the framework of the plan revision.</p>
	<p>2009: AFAD established "First comprehensive institution about disasters"</p>	<p>Disaster related institutions merged in an institution.</p>	<p>2011: New City Centre Implementation Plan by Bayraklı Municipality, 1/1000 scale</p>	<p>"First plans of Bayraklı Municipality" It is mostly still in effect. Although "the region consists of areas that will be affected by a possible earthquake" annotation is included in plan, there is not a determination regarding earthquake risk zones. Also, there are not infrastructural or regional decision regarding on disasters, and measures are generally structure-based.</p>
	<p>2011- Ministry of Environment and Urbanization was established - State Planning Organisation closed</p>	<p>Duties and responsibilities in terms of planning and disaster management shifted.</p>	<p>2012: İzmir Metropolitan Environmental Plan, by İzmir Metropolitan Municipality, 1/25000 scale</p>	<p>It is still in effect. Seismicity and earthquake hazard analysis were included in the plan report. In the plan annotations there were important decisions regarding earthquake risk management. However, these were not reflected in practice. Sub-scale plans that needed to comply with the upper-scale plans were not revised.</p>
	<p>2012: Catastrophe Insurance Law No. 6305 - Transformation of Areas at Disaster Risk Law No: 6306</p>	<p>The first comprehensive law on disaster risk areas.</p>	<p>2014: İzmir-Manisa 1/100000 Environmental Plan, by Ministry of Environment and Urbanization</p>	<p>"First plan on this scale" Plan hierarchy was broken. Geological and geotechnical survey report covering the study area was approved by the Ministry of Environment and Urbanization after the plan, in 2015.</p>
	<p>2018: Turkey Earthquake Zones Map revision</p>	<p>(Appendix 7)</p>	<p>2020: 1/5000 scale Revision Master Plan for Reserve Building Area, by Ministry of Environment and Urbanization</p>	<p>It was based on law no.6306. The case study area was not included the plan. Made for exposed people from the Samos earthquake.</p>
	<p>2019: Earthquake Regulation Revision</p>	<p>Construction conditions for the regions revised based on new map.</p>	<p>2022: Adalet and Manavkuyu Neighborhoods Master Plan Revision, by Bayraklı Municipality and İzmir Metropolitan Municipality, 1/1000 scale</p>	<p>(The plan report could not be accessed)</p>

In conclusion, the Marmara earthquake in 1999, was a breaking point for Turkey and İzmir in many ways. The earthquake in 2020, around which the case study was also shaped, caused radical changes in İzmir's perspective on earthquakes. On the other hand, the 6 February 2023 Kahramanmaraş earthquake, which occurred during the preparation of this thesis, is the biggest earthquake disaster in the history of the republic. Although, Turkey and İzmir have experienced many large and devastating earthquakes and disasters in history, they are still not ready. Increasing urbanisation rate increases the risk of disaster and the number of possible exposed people and components. Dense, unplanned, uncontrolled construction is one of the most important factors that increase vulnerability to earthquakes. However, this does not mean that exposures to earthquakes should be evaluated on a parcel or structure basis. On the contrary, as seen in the case study area, the identification of risk areas and disaster-resilient spatial planning strategies are extremely critical in terms of precautions to be taken. Identifying hazards and making risk assessments, determining the level of vulnerability, and holistic spatial planning strategies developed in this direction are the most effective methods to reduce the effects of earthquakes and other disasters that it may trigger. Spatial planning decisions and practices should be prepared with the concern of being prepared for earthquakes and other disasters, and spatial planning processes should be managed with a holistic approach. Plans should integrate and conserve the natural environment, considering ecological constraints. Settlements in earthquake-prone areas should be avoided. The expropriation or eviction of all these settlements is not practicable. However, settlements can become more resilient against natural hazards by reducing risks with land use control, transportation-infrastructure planning, urban transformation, and renewal practices, both at the structural level and at the planning scale within the framework of existing risks.

Geoscientific data should be a key input to plans of all types and scales. This also requires reforming planning legislation. The legislation in force today is guiding and encouraging in this respect. By considering inputs such as natural thresholds, geological, geomorphological, and hydrological characteristics, disaster hazard and risk maps and micro zonation studies should be made based on plans at all scales. Definitions and methods regarding this should also be included in the legislation. Plans and zoning practices should not be shaped by regulations; revisions should be made in the laws. Because planning processes are becoming increasingly complex in terms of additions to the legislation and the rights defined to institutions. There are problems in the reflections

of plans of different scales in practice, both due to this situation and the inability to produce analysis specific to each plan scale.

The current planning system in the case area is made mostly for the purpose of providing construction and attracting investment, and the construction sector is constantly encouraged. According to disasters and current needs, the necessary steps should be taken in terms of renovating, rehabilitating, preventing and, if necessary, removing the existing built areas on a large scale. Despite the great losses experienced after the disasters, the necessary systemic corrections cannot be realized at a sufficient level. Our planning system does not contain sufficient provisions on how to prevent risky areas before disasters occur. Disaster legislation still made for post-disaster activities in disaster-affected areas.

The current planning system in the case area is made mostly for the purpose of providing construction and attracting investment, and the construction sector is constantly encouraged. However, according to disasters and current needs, the necessary steps are not taken in terms of renovating, rehabilitating, preventing and, if necessary, removing the existing built areas on a large scale, as well as conserving and maintaining natural and cultural values. Despite the great losses experienced after the disasters, the necessary systemic corrections cannot be realized at a sufficient level. Our planning system does not contain sufficient provisions on how to prevent risky areas before disasters occur. Disaster legislation still made for post-disaster activities in disaster-affected areas.

Planning activities of different types and scales carrying out by different organizations with different understandings, methods disrupt the integrity. Plan hierarchy should be preserved. However, especially in upper-scale plans, geoscientific data and disaster risks are not transferred to the plans or are not transferred adequately. Technical personnel carrying out geological-geotechnical surveys and micro zonation studies should accommodate in institutions with the authority to make and approve plans. Disaster-priority upper-scale decisions should be transferred to sub-scale plans by developing geoscientific data and diversifying them in accordance with the scale. All implementations based on the sub-scale plan must be inspected by local governments.

The demand for construction in sensitive areas in terms of environmentally, natural, geologically etc. should be limited. A rational land use policy based on the effective use of existing settlements should be followed. For urban development demands,

instead of low-density settlements developing on the peripheries, areas that cannot be used effectively in existing settlements or that have lost their function should be preferred. Urbanization and population growth should not coincide with areas exposed to natural hazards. A long-term perspective should be adopted. Post-disaster decisions aimed solely at crisis management lead to bigger problems. Shelter, economic activity and access to public services and safe living issues should be given importance. Land use policies should drive safe urban development. The risks on the economic and social structure should be considered. Development strategies should not preclude disaster-resistant strategies in plans. Arrangements should be made regarding the rights of ownership. Especially unplanned settlements with disaster risk should be prioritized. Practices such as property rights in heavily damaged and destroyed buildings, limitation of property rights as a result of expropriation or transfer of property rights that cannot be used effectively enough in Turkey should be handled sensitively in terms of equal distribution of resources. State aid should be provided in this regard; the society should be encouraged to take precautions and awareness should be raised. Property norms should not hinder urban resilience. Government policies in disaster mitigation should guide the sustainability of the public, the state and environmental resources, and the equal sharing of resources in the long term. Emergency and mitigation plans should be made to be constantly updated.

Creating earthquake resistant cities, not turning into earthquake hazards into disasters is possible with planning the spatial setup and functioning of the city by considering earthquakes (and disasters). Disaster sensitive spatial planning strategies needs to still be developed for earthquake resistant cities. Natural hazards, especially earthquakes, are not preventable events. Not all disaster-related risks can be eliminated, but risks can be balanced against social, economic, and environmental development goals. Earthquake resistant cities include not only durability, invulnerability, minimum damage, prevention of loss of life and property, but also ensuring the sustainability of cities.

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APPENDICES

APPENDIX 1: First Law Related with the Earthquake Risk Management: Law on Measures to be Taken Before and After Earthquakes No. 4623, in 1944

T.C. Resmî Gazete

Teslis tarihi : 7 Teşrinievvel 1336 - 1920

<i>İdare ve yasa işleri için Bâyeskâdet Nefriyat ve Müdevvenat Umum Müdürliğüne müracaat olunur</i>	22 TEMMUZ 1944 CUMARTESİ	SAYI : 5763
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KANUNLAR

Yersarsıntıdan evvel ve sonra alınacak tedbirler hakkında kanun

Kanun No: 4623

Kabul tarihi: 18/7/1944

Madde 1 — Tehlikeli yersarsıntısına maruz bölgeler Nafia ve Marifet Vekâletlerinde müştereken inzar ve İcra Vekâletleri Heyetinin tasdik edeceği listeler veya haritalarla tâyin olunur.

İlk tedbirler

Madde 2 — Tehlikeli yersarsıntısı bölgesine dâhil olsun olmasın bütün vilâyetlerde aşağıdaki tedbirler alınır.

Kurtarma, yaralıları tedavi, barındırma, ölüleri gömme, yangınları söndürme, yıkıntıları temizleme ve felâketzedeleri işe gibi hususlarda kullanmak üzere vazife ve vazifelerini tâyin, içtima mahallerini tesbit eden bir program tanzim ve icabeden vasıtalar inzar ve muhafaza olunur. Bu program Dahiliye, Nafia, Sıhhat ve İçtimai Muavenet Vekâletlerince müştereken tesbit edilecek esaslar dâhilinde yapılır.

Madde 3 — Yersarsıntısı vukuunda mahallin mülkiye Amiri, hâkim emrine dâhil memurlar hariçinde, memur olsun veya olmasın lüzum gördüğü kimselere vazife vermeğe, bedelli veya ücretli bilâhare ödenmek üzere canlı veya cansız nakil vasıtalarına ve lüzumlu alet ve edevata el koymağa ve hiç bir kayıt ve mersasime tabi olmadan tedavi, kurtarma ve işe gibi işlerin icabettirdiği acil mübayaaları yapmağa, tehlikeli binaları tahliye ve müsait bina ve meskenleri ılgat etmeğe salâhiyetlidir.

Yersarsıntısı vukubulan yerlerdeki mülkiye Amiri yardım teşkilât ve vasıtalarının kifayetsizliği karşısında civarındaki vilâyet ve kazalardan yardım ister. Kendilerinden yardım istenilen vilâyet ve kazaların mülkiye Amirleri birinci fıkrada yazılı salâhiyetleri husus olarak bütün imkân ve vasıtalarıyla yardıma koşmağa mecburdur. Yersarsıntısı vukubulan yerdeki mülkiye Amiri civarındaki mülkiye Amirlerinin yukarıdaki fıkraya muvafık yardımına lüzum görmeyip te yalnız bunlara bağlı bazı komşu köy ve kasaba halkının yardımına lüzum hissettiği takdirde bu köy ve kasaba halkını yardıma çağırır, bunlar mevcut buldukları mülkiye Amirlerinden emir beklemeksizin bütün imkân ve vasıtalarıyla yardıma koşmağa mecburdurlar. Şu kadar ki, bu komşu köy ve kasabaların bağlı oldukları vilâyet veya kazaya malûmat verilir.

Mahallin mülkiye Amiri bu işlerin yapılmasında, lüzum halinde gerek o yerde ve gerek civarda bulunan asker, jandarma, gümrük muhafaza ve orman koruma kütanelerinden ve bunların vasıtalarından da istifade eder. Bu takdirde bu kuta komutanları mafevklerinden emir beklemeksizin kendilerinden istenilen yardımcı derhal yapmağa mecburdurlar.

Bu maddede mülkiye Amirine verilen vazife ve salâhiyetler nahiyeye merkezi olmayan belediyelerde belediye reisleri, köylerde muhtarlar tarafından kullanılır.

Madde 4 — Muhsabere vasıtan bulunan şahıslarla resmî ve hususî idare ve müesseseler, yersarsıntısı vukuu hakkında edinecekleri haberi ilk vasıta ile muntakamın mülkiye Amirine derhal bildirmeğe mecburdurlar.

İlk yardımlar için çıkılacak tel yazıların ve telefon muhaberecilerinin posta, telgraf ve telefon merkezleri, demiryolu istasyonları ve askeri muhabere teşkilatları paranz, tercihan ve acile olarak kabul etmeğe ve bu yazıyı alanlar da ilk vasıta ile yerine ulaştırmağa mecburdurlar.

Madde 5 — Yersarsıntısı vukuunda ilk yardımları temin maksadıyla yersarsıntısı bölgesine üçüncü maddede yazılı mülkiye Amirleri ile alakalı makam ve müesseseler tarafından gönderilecek yardım ekipleri ve her türlü malzeme ve âletler Devletin veya Devlete bağlı idarelerle sermayesinin çoğu Devlete ait müesseselerin elinde bulunan nakil vasıtalarıyla bedelli sonradan Hükümetçe ödenmek üzere tercihan sevk edilir.

Madde 6 — Gerek yersarsıntısı esnasında gerek kurtarma ve yardım işlerinde çalıştırılacak yaralananlar veya sakatlananlar en yakın hastane veya tedavi yerlerine sevk edilirler. Askeri hastane ve tedavi yerleriyle Devlet, hususî idare ve belediyelere ve şahıslara ait bütün hastane ve tedavi yerleri bu yarınlı ve sakatları hemen kabul ve tedavi etmeğe mecburdur.

Resmî hastane ve tedavi evlerinde bunlara paranz bakılır. Resmî hastane ve tedavi evlerinde yer olmaması veya tedavi imkânı bulunmaması gibi sebeplerle zaruri olarak hususî hastanelerde yapılan tedavi ücretleri sonradan Hükümetçe ödenir.

Madde 7 — Yersarsıntısı vukuunda ilk kurtarma yerinde çalıştırılanlara bedeli hizmetlerinden dolayı ücret verilmez. Yalnız çalıştırdıkları müddetçe paranz etmek ve katık temin edilir. Bunların beraberlerinde getirdikleri âlet ve vasıtalarından tamire muhtaç hale gelenler, masraflı Hükümetçe ödenmek üzere tamir ettirilir. Ziyas uğrayanlar ile tamiri imkânı olmayan bedelli mahalli rayıç üzerinden ödenir.

Madde 8 — Salâhiyetli makamların verecekleri vazifeleri yapmayanlar hastalık veya mâkul diğer bir sebep olmadıkça iş başına sevk etmeğe mahallin mülkiye Amiri mesumdur. Bu husustaki emirleri zabıta kuvvetleri derhal ifa etmeğe mecburdurlar.

İlk tedbirleri takip eden işler

Madde 9 — Yersarsıntısı mütaakip Nafia Vekâletince kurulacak fen heyetleri tarafından resmî ve hususî bütün binalar tetkik ve muayeneye tabi tutulur. Bunlardan yıktırılması ve boşaltılması gerekenler hakkında fen heyetlerince mahallin mülkiye Amirine rapor verilir.

Bu maksadla bu binalar derhal boşaltılır. Yıkılması icabedenler için en çok 15 gün müddet verilerek tehlikenin giderilmesi sahiplerine bildirilir. Mahallinde sahibi bulunmadığı takdirde keyfiyet mahallî vasatlarla ilân edilme suretiyle tebliğ yapılmış sayılır. Mal sahibi yıkılmadığı takdirde bu binalar, yıkma parası yıkıntı bedelinden ödenmek üzere mahallin mülkiye Amirinin emriyle yıktırılır.

Tehlikeli fakat ıslah mümkün olan binaların fen heyetlerinin gözetileceği şartlara göre tamiri yapılmaya kadar içine girilmesine ve oturulmasına müsaade edilmez. Bu binalar bir sene zarfında tamir ettirilmediği ve iltiraz da olmadığı takdirde yukarıdaki esaslar dairesinde yıktırılır.

İltiraz vukuunda keyfiyet mahallî idare heyetlerince tetkik olunur. İltiraz sebepleri varit görüldüğü takdirde müddet daha iki seneye kadar uzatılabilir.

Madde 10 — Yersararntısı dolayısıyla büyük hasara uğrayan şehir, kasaba ve köy yerlerinin Devlet hizmetinde bulunan veya haricte çalışan jeolog ve sismologları da İltiva etmek üzere Nafia Vekâletinin tebliğ edeceği mütehasas fen heyetlerince değiştirilmesine lüzum görüldüğü takdirde şehir, kasaba ve köylerin yerleri bu raporlara müsteniden Nafia Vekillığının teklifi ve İcra Vekilleri Heyetinin kararıyla değiştirilir.

Yukarıda yazılı fen heyetlerince Dahiliye, Şehât ve İçtimâl Muavenet ve Ziraat Vekâletlerinin müesseseleri de bulunur.

Madde 11 — Yersararntısı bölgelerine dâhil şehir, kasaba ve köylerde bina ve mesken inşaatı fen heyetlerince tehlikeli görülen mahaller yapı için yasak bölge sayılır. Belediye teşkilâtı olan yerlerde belediyeler, olmayan yerlerde muhtar ve ihtiyar meclisleri bu yasak bölge hükümlerini tatbik ile mükelleftir. Hükûfına hareket edildiği takdirde yapılan veya yapılmakta olan binalar valî ve kaymakamların emriyle yıktırılır.

Madde 12 — Yersararntısı dolayısıyla hasara uğramış olan şehir ve kasabaların İmar plânı mevcut olup da Nafia Vekâletince tedilime lüzum görülmediği takdirde esaslı inşaat derhal müsaade edilir.

Mevcut İmar plânının tedilime lüzum görülün şehir ve kasabalarda bu tedilât plânları beş ay zarfında İsmal edilir.

İmar plânı mevcut olmayan yerlerin İmar plânı azami üç sene zarfında İhar olunur. Bu plânlar yapılmaya kadar müstakbel plânlara göre esaslı inşaat yapılmasına Nafia Vekillığınca müsaade edilebilir.

Yukarıda yazılı hallerde veya yerinin değiştirilmesi icabeden şehir ve kasabalarda alkâhların kendi arsaları üzerine ilk barınma tedbiri olarak muvakkat barına inşasına izin verilir.

Bu nevi muvakkat inşaatın, İmar plânı mevcut olan yerlerde yersararntısı vukuundan, İmar plânı olmayan veya tedil edilen veya yerleri değiştirilecek olan şehir ve kasabalarda yeni plânlara tasdikünden itibaren üç sene içinde sahipleri tarafından yıkılması mecburidir. Akat halde masrafları yıkıntı bedelinden ödenmek üzere mahallin mülkiye Amirî emriyle belediyelere yıktırılır.

Bu üç senelik müddet, zaruret halinde Nafia Vekillığının teklifi üzerine İcra Vekilleri Heyetine lüzumu kadar uzatılabilir.

Usmâmî hükümler

Madde 13 — Birinci madde mucibince tesbit edilen yersararntısı bölgelerinde yeniden yapılacak veya değiştirilecek veya bilyitilecek veya esaslı tamir göreceği resmî ve hususî bütün yapıların tâbi olacağı şartlar Nafia Vekâletince tanzim edilecek esaslar dâhilinde tâyin olunur. Bunun haricinde inşaat yasaktır.

Bunun için:

A) Belediye teşkilâtı olan yerlerde 2290 sayılı Belediye Yapı ve Yol lar Kanunu gereğince verilecek ruhsatlıyelerde bu esasların gözönünde bulundurulması mecburidir.

B) Belediye teşkilâtı olmayan yerlerde ihtiyar meclisleri bu hükümlü tatbik etmekle mükelleftir.

Bu madde hükümlerine aykırı olarak yapılacak inşaat 9 uncu maddede zikredilen usul dairesinde mahallin mülkiye Amirinin emriyle yıktırılır.

Madde 14 — Her ne suretle olursa olsun yeniden kurulacak köyler Dahiliye, Nafia, Şehât ve İçtimâl Muavenet Vekâletlerinin birlikte tesbit edeceği esaslar dâhilinde Vilâyet Nafia Müdürlüğünce tanzim oluncak plânlara göre kurulu. Ancak bu plân dairesinde inşaat müsaade edilir. Bu hükümler dışında köy kurulması yasaktır. Akat halde yapılmış ve yapılmakta olan binalar yıktırılarak inşaat men edilir.

Madde 15 — Tehlikeli yersararntısı bölgesinden başlamak üzere Nafia Vekâletince tesbit edilecek program dâhilinde şehir, kasaba ve köylerdeki Hükümet konağı, hastane, mektep, fabrika ve iş yerleri gibi bir çok

kimselerin toplandığı resmî, hususî bina ve müesseseleri sinema, tiyatro, gazino, kahvehane, han, hamam ve otel gibi umuma açık bulundurulmuş yerlerin yersararntısına dayamıklı olup olmadıkları Nafia Vekâletince tâyin oluncak fen heyeti tarafından tetkik ve muayene edilerek raporları mahallin mülkiye Amirine verilir. Bu raporlara nazaran mülkiye Amirî Belediye teşkilâtı olan yerlerde Belediyeler, olmayan yerlerde ihtiyar meclisleri vasıtasıyla tehlikeli görülenleri derhal boşalttırır ve kapatır. Bunlardan tamir ve takviye suretiyle ıslah mümkün olmayanların bu maksadlarla kullanılmasına müsaade edilmez. Tamir ve takviye edilerek ıslah mümkün olanların fen heyetlerince gösterilen esaslar dâhilinde gereken tamirleri yapıldıktan sonra kullanılmasına izin verilir.

Madde 16 — Birinci madde mucibince tesbit edilen bölgelerde yeniden yapılacak sinema, tiyatro, otel, kahvehane, fabrika gibi umumi toplantı ve iş yerlerinin projeleri Nafia Vekâletine veya Nafia Vekâletinin göstereceği dairelere tasdik ettirilir. Akat takdirde bunların inşaatlarına müsaade edilmez.

Madde 17 — Yersararntısı dolayısıyla gerek yerleri değiştirilecek şehir, kasaba ve köylerin yeniden tesbit ve gerek mevcut şehir ve kasaba ve köylerin tevzili ve yersis kulanlara yer temini için, İcra Vekilleri Heyetince âmme menfaati namına istimalî kararları verilen binaların hasarları değer pahası peşin verilmek suretiyle, bu şehir ve kasabalar belediyeleri ve bu köyler ihtiyar meclisleri istimalîke ve müstahkemlerine paralı parasız tevzi salâhiyetlidir.

Madde 18 — Şehir ve kasabalar için istimalî kararları verilen sahanın ve içindeki binaların hasarları gayrimenkullerden her birinin 3710 sayılı Belediye İstimâlî Kanununun hükümlerine tevfiқан haritaları tanzim ve gayrimenkullerin eski hallerine göre kıymetleri takdir olunarak istimalîke ait mütaakip muameleleri yapılır. Şu kadar ki, gayrimenkullere takdir edilen bu kıymetler, belediye tarafından sahiplerine birer İbarname ile tebliğ edilir. İkametgâhi meçhul olan gayrimenkul sahiplerine yapılacak tebliğler mutat vasıtalarla ilân suretiyle yapılır. İbarnameseyi kabul ve imzadan imtina edenler için tutulacak zabıt varukaları tebliğ hükmündedir.

Gayrimenkulün miktar ve mesahası veya takdir edilen kıymeti hakkında tarafların alâkâli müşkemelerle müraacaatı İtirazda bulunmaları ve bu hususta duruşmanın başlamış olmasa, gayrimenkulün belediye namına tapuya kayıt ve tesciline ve elkonmasına hiç bir suretle mâni olamaz.

Madde 19 — İstimâlî suretiyle belediyenin tasarrufuna intikal etmiş olan bu yerler yeni şehir veya kasabanın İmar plânlarına göre parsellere ayrılır. Bu şehir plânına göre tiplendirilen arsalar tapu veya vergi kayıtlarına ve şehir ve kasabanın eski yerinde yer sararntısından zarar görenlerin inşaatı kabul ve taahhüt ettikleri bina tiplerine dair verecekleri beyannamelelere göre gruplara ayrılarak tasnif edilmek ve aralarında kura çekilmek suretiyle bedelsiz olarak tevzi edilir.

Bundan başka eski şehir veya kasabada bir veya müteaddit bina veya arsaları bulunanlara da bu gayrimenkullerin cins ve novlerine göre ve her parçasına mukabil bedelsiz ayrıca birer arsa dâha verilir.

Madde 20 — Yersararntısı dolayısıyla, âmme menfaati namına istimalî kararları verilen gayrimenkullerin gerek belediyeler namına devir ve ferâğ ve gerek belediyeler tarafından istimalî sahiplerine tevzi ve tapuca tescil muameleleri, ferâğ ve istimalî harçlarından ve diğer her nevi harç ve resimlerden muafır.

Madde 21 — İstimâlî sahası dâhilinde bulunan Devlete ait ve bir âmme hizmetine tahsis edilmemiş gayrimenkuller belediyeye bedelsiz olarak devir ve ferâğ edilir.

Madde 22 — Köyler için istimalî Köy Kanunundaki hükümlere tabidir. Köylerde istimalî edilen bu yerler köy ihtiyar meclisi kararıyla müstahkemlerine paralı veya parasız tevzi olunur. Tevzi, şehir ve kasabalara tatbik edilen esaslar dâhilinde yapılır.

Madde 23 — Bu kanunun muhtelif maddelerinde yapılacak ve ödenmesi tasnif edilen masraflar Nafia Vekâleti bütçesine konulacak tahsattan ödenir.

Bu kanunun ikinci maddesi mucibince alınacak tedbirler için yapılacak masraflara Dahiliye, Maliye, Nafia ve Şehât ve İçtimâl Muavenet Vekâletlerince müştereken tesbit edilecek esaslar dairesinde hususî idareler, Belediyeler ve köyler de iştirak eder.

Madde 24 — Nafia Vekâleti bu kanun hükümlerinin tatbik suretini murakabe ile mükelleftir.

Madde 25 — Bu kanunun 10, 11, 12, 13, 14, 15, 16 ncı maddelerinde yazılı muamelelerden dolayı kazai mercilerde dâva açılmaz.

Madde 26 — Birinci derecede yersararntısı neticesinde harap olan veya zarar gören bölgelerin süratle inşaatı ve kalkınmasını kolaylamak

ve ayrıca yurtta dayanıklı, fennî, mihî ve uzuz mesken yapılmasını sağlamak üzere 3460 sayılı kanun hükümlerine tabî ve Nafia Vekâletine bağlı bir İktisadi Devlet tepekkimî kurulur.

Madde 27 — Yersarsıntıları dolayısıyla sahip, zilyed, müfetti ve kiraat üfatiyle ellerinde bulunan menkul ve gayrimenkul malları tamamen veya kısmen mahv ve harap olmuş veya hasara uğramış hakiki veya hükmi şahıslar namına yer sarsıntısının vuku bulduğu mahallerde tahakkuk ettirilmiş olupta henüz tahsil edilmiş bulunan Devlet, vilâyet ve belediyele ait vergi, resim ve harçların, gördükleri zarar derecesine göre tamamen veya kısmen terkine İcra Vekilleri Heyeti salâhiyetindedir.

Yersarsıntısının vukuu tarihine kadar olan zamana ait olupta henüz tarh ve tahakkuk ettirilmemiş olan vergiler hakkında da aynı surette muamele yapılır.

Zararın miktarı ve nispeti mahallin idare heyetince tesbit olunur.

Madde 28 — Yersarsıntıdan müteasir olan muntakaların İcra Vekilleri Heyetince tesbit olunacak mahallerde usumî muvazeneden maas ve ücret alan memur ve müstahdemlerden yardımına muhtaç olacak derecede manen veya bedenen ehemmiyetli zararlara uğradıkları mahallî idare heyetlerine tasdik olunmaları maas veya ücretleri tutarının iki mislini, tekaüt ve yetimlere maasları tutarının üç mislini geçmemek üzere İcra Vekilleri Heyetince tâyin edilecek miktarda avans verilebilir.

Henüz tahsis muamelesi yapılmamış olan yetimlere avans itasında yetim maasına veya ikramiyeye müstenit olan memuriyet maasları esas tutulur.

Bu avanslar, maas veya ücretlerde müsavi takaslarla tevkif olunmak suretiyle tediye tarihlerinden itibaren en çok iki yıl zarfında istirdat olunur.

İkramiyeye müstahak olanların borçları ikramiyelerinden tevkif edilir.

Tahsis muamelesi yapılmamış olan yetimlerden nüfus kâğıtları ziyas uğramış bulunanların istihkak iddialarının tevsiği için İdare Heyeti mazbataları da kabul olunur. Bu maddenin tatbiki için nüfus dairelerinden alâkâlların talebi üzerine verilecek metin suretleri ile İdare Heyetlerine verilecek mazbatalar her türlü harç ve resimden muaftır.

Madde 29 — Yukarıki madde mücbince İcra Vekilleri Heyetince tesbit edilecek yerlerde mülhak bütçeli idarelerle husulî idare ve belediyelerden ve 3650 sayılı kanuna tabî müesseselerden maas ve ücret alan memur ve müstahdemlerle müteakıt ve yetimlerden yukarı maddede yazılı şekilde zarar gördükleri tasdik edilecek olanlara aynı maddede yazılı şekilde ve miktarda avans ita ve istifasına alâkâlı vekiller mezumdur.

Henüz tahsis muamelesi yapılmamış olan yetimler hakkında da yukarıki madde hükmi tatbik olunur. Bu madde hükmine tevfikan verilecek avansların tediyesine mâil istisnâta müsait olmayan belediyelerle vilâyet husulî idarelerine bu avansın karşılamak üzere Hazinece kafalet edilmek suretiyle kredi açtırılır.

Ceza Hükümleri

Madde 30 — Yardıma davet anında şehir, kasaba ve köylerde bulunmakta sâhî durumları elverişli olduğu halde makbul bir sebep olmaksızın bu davete icabet etmeyenlerle gidip gelmeyenlerden vali veya kaymakamın kararıyla 25 liradan 100 liraya kadar ceza alınır. Ancak hasatlığı sabit olanlardan bu ceza kaldırılır. Bu kararlar katidir.

Devlet ve Devlete bağlı idarelerde sermayesinin çoğu Devlete ait müessese memurlarına yer sarsıntısı dolayısıyla verilen vazifeyi ifada ifsal veya süstimalerinden veya bu maksatla kendisine verilen para ve malları zimmete geçirmelerinden veya sair fişilerinden dolayı Devlet memurları hakkındaki ceza hükümleri tatbik olunur.

Madde 31 — Yer sarsıntısı bölgelerinde felâketzedelere yardım maksadıyla Devlet dâire ve müesseseleriyle hususî idareler, belediyeler ve köyler ve Âmmen menafiline hâdim hayır cemiyetleri tarafından bedelli veya bedelsiz olarak verilen inşaat malzemesi veya diğer alet ve edevat satan veya başka mekânlarla kullanımlar hakkında vilâyetlerde valiler, kaza, nahiy ve köylerde kaymakamlar tarafından 10 liradan 100 liraya kadar ceza alınmakla beraber bu mallar istirdat olunur. Mevcut olmayan malların bedelli tahsil edilir. Bu karar katidir. Bu bedel hiç bir vakit mahul maliyet fiyatından aşağı olamaz. Mal bedelinin tahsiline dair olan karar Tahsilî Emval Kanununa göre İcra olunur.

Madde 32 — Hasarı mücip yer sarsıntısı ve onu takip eden on gün zarfında mezdâr bölgelerde Cesa Kanununun ikinci kitabının 7 nci, 8 inci, 9 uncu ve 10 uncu bablarında yazılı suçları işleyenler hakkında tâyin edilecek cezalar giddet sebebi nazarı dikkate alınarak hükmedilir.

Muvakkat madde 1 — 1938 senesindenberi yer sarsıntısına maruz kalmış yerlerde de bu kanunun 9, 10, 11, 12, 17, 18, 19, 20, 21 ve 22 nci maddeleri tatbik olunur.

Muvakkat madde 2 — Tokat, Çorum, Balıkesir Vilâyetlerindeki yer sarsıntısından müteasir olan muntakalarda zarar görenlere yapılacak yardım hakkındaki 4386 sayılı kanunun neğrinden sonra vukubulan yer sarsıntıları bölgelerinden İcra Vekilleri Heyetince tesbit edilecek yerlerde :

A) Şahip veya zilyedi bulunduğu veya kira ile oturduğu evi yıkılmış veya içinde barınılmıyacak derecede mahv ve harap olmuş bulunanlar namına mezkûr mahallerde 423, 797, 1833, 1837, 1852, 1896, 2395, 2416, 3843, 2728, 2729, 2731, 2897 sayılı kanunlarla zeyil ve tadilîle mücbince yersarsıntısının vukuu tarihine kadar tahakkuk ettirilip de bu kanunun neğri tarihinde tahsil edilmiş olan vergi ve resimlerle zamları terkîh olunur.

Zelzelemin vukuu tarihine kadar olan zamana ait olup henüz tarh ve tahakkuk ettirilmemiş olanlar tahakkuk ettirilmez.

B) İkametgâhı yıkılmamış veya oturulamıyacak derecede mahv ve harap olmamış olanlardan ticarethane veya akarı yıkılmış veya mahv ve harap olmuş bulunanların yalnız bu ticarethane ve akarlardan mütevellit vergiler hakkında da A fıkrası hükmi tatbik olunur.

Muvakkat madde 3 — Bu kanunun neğrinden önce 3908 sayılı kanun hükümlerine göre başlanmış olan işler o kanunun hükmi dairesinde neticelendirilir.

Madde 33 — Bu kanun neğri tarihinde mer'îdir.

Madde 34 — Bu kanun hükümlerini yerine getirmeğe İcra Vekilleri Heyeti memurdur.

19/7/1944

No.	Büyük	Müsteri Tevki	Gil	Saklık	İzmir	Genel
Bu kanunda sâhî geçen kanunlar:						
423	5 şubat 1923 tarihli Tahsilî Emval Kanunu	2	1	624	—	—
432	Belediye Vergi ve Resimleri Kanunu	3	5	642	—	—
432	Kir Kanunu	3	5	696	—	—
705	Tük. Cesa Kanunu	13/3/1928	5	7	956	139
797	Vazir ve İktisat Veziri hakkında kanun	17/8/1928	5	7	1116	348
1833	Amal Vergisi Kanunu	6/7/1931	8	15	501	1842
1837	Bira Vergisi Kanunu	14/7/1931	3	12	434	1014
1852	1928 senesinde Suse ve Kütahya Kanununa bu mahallede-tilde müllî hakkında kanun	2/8/1931	3	12	1056	1862
1896	1936 senesinde Kocaeli, Bursa, Vangil Kanununa müsterî kanun	11/8/1932	3	19	495	2112
2280	Belediye Yarı ve Yelir Kanunu	21/8/1933	3	24	1409	2437
2343	Kanun Vergisi Kanunu	25/3/1934	3	15	234	2652
2416	İhtisatî Bakanlar Vangil Kanununa müsterî kanun	3/8/1934	3	15	175	2690
2728	İktisatî Bakanlar Vergisi Kanununa müsterî kanun	24/6/1934	3	16	847	3615
2729	Kanun vergisine dair olan 2395 sayılı kanuna ek kanun	29/7/1934	3	16	1107	3677
2731	Bu maddelerden istihkak vergisi alması hakkında kanun	28/8/1935	3	14	640	3014
2897	Devlet memurları kanunu	1/6/1935	5	16	1157	3577
2908	Devlet memurları kanunu	29/7/1935	5	17	306	3528
3149	Sermayesinin tamamı Devlet tarafından verilmiş memurların (ikiinci maddelerinde tekdüze ile de mevkâ-leri hakkında kanun	4/7/1936	3	19	1206	3396
3659	Devlet ve Devlet müesseselerinde memurların tahsil ve tedvili hakkında kanun	11/7/1939	5	20	1589	4255
3710	Belediye İhtisak Kanunu	14/7/1939	3	20	1785	4250
3841	Muamele Vangil Kanunu	4/8/1940	3	21	500	4526
3908	Yeni kanunla değiştirilen veir veirle istihkak dair kanun	10/8/1940	3	21	2051	4584
4386	Tokat, Çorum ve Balıkesir Vilâyetlerindeki yersarsıntısından müteasir olan muntakalarda zarar görenlere yapılacak yardım hakkında kanun	27/7/1943	3	24	347	5311

Devlet memurları aylıklarının tevhit ve teadülüne dair olan 3656 sayılı kanunla eklerine bağlı cetvellerin Maarif Vekilliği kısımlarında değişiklik yapılması hakkında kanun

Kanun No: 4624

Kabul tarihi: 18/7/1944

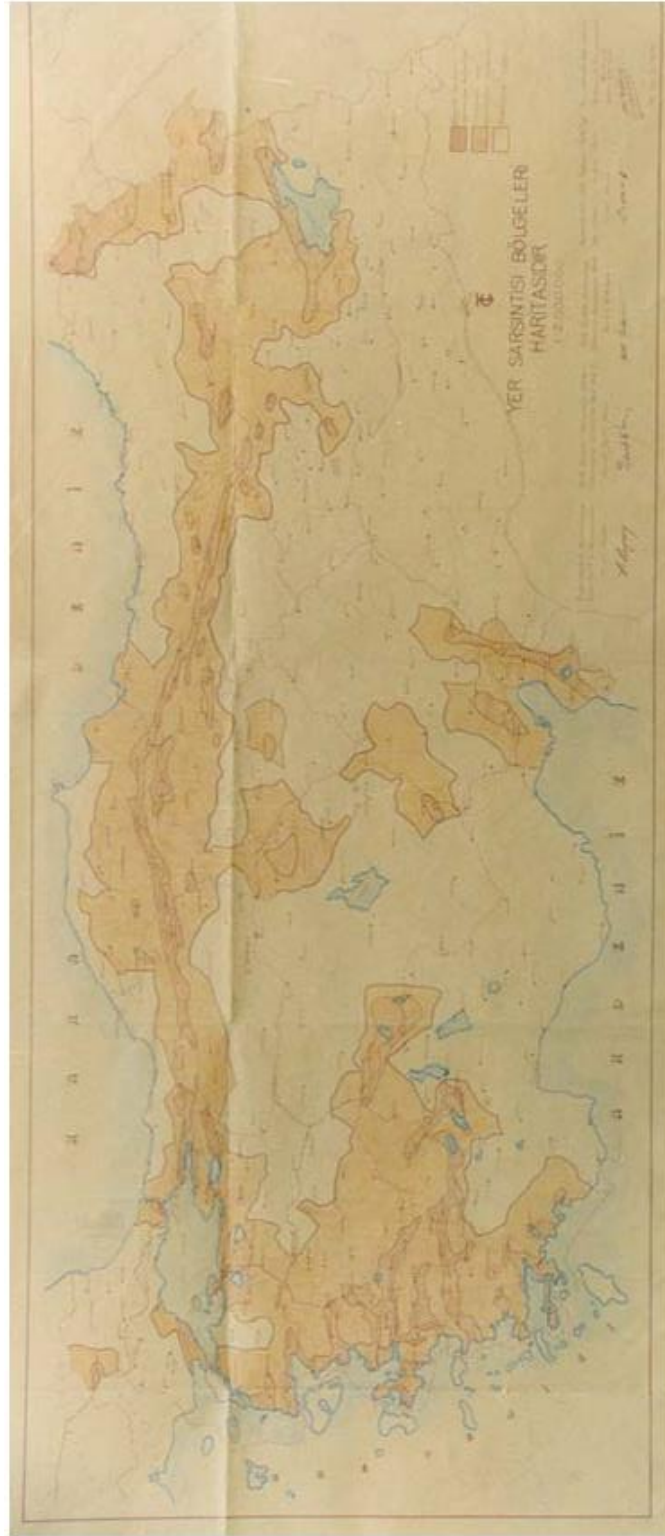
Madde 1 — 3656, 4121, 4122, 4365 sayılı kanunlarla Maarif Vekilliği için kabul edilen kadrolardan ilâk (1) sayılı cetvelde yazılı olanlar kaldırılmış ve yerine (2) sayılı cetvelde yazılı kadrolar konulmuştur.

Madde 2 — 3656 sayılı kanuna bağlı (3) sayılı cetvelin Maarif Tet-tih Heyeti kısımlarındaki kayıt bütün müfettişlere şâmil olmak üzere «Bunlardan dördü yabancı memleketlerde talebe müfettişliği olarak istih-dam olunabilir» şeklinde değiştirilmiştir.

Madde 3 — Bu kanuna bağlı (3) sayılı cetvelde unvanları yazılı vazifeleri munzam olarak deruhte edenlere hıızlarında gösterilen miktarda munzam vazife tarrimatsız 3656 sayılı kanunun 18 inci maddesi hükümleri dairesinde verilir.

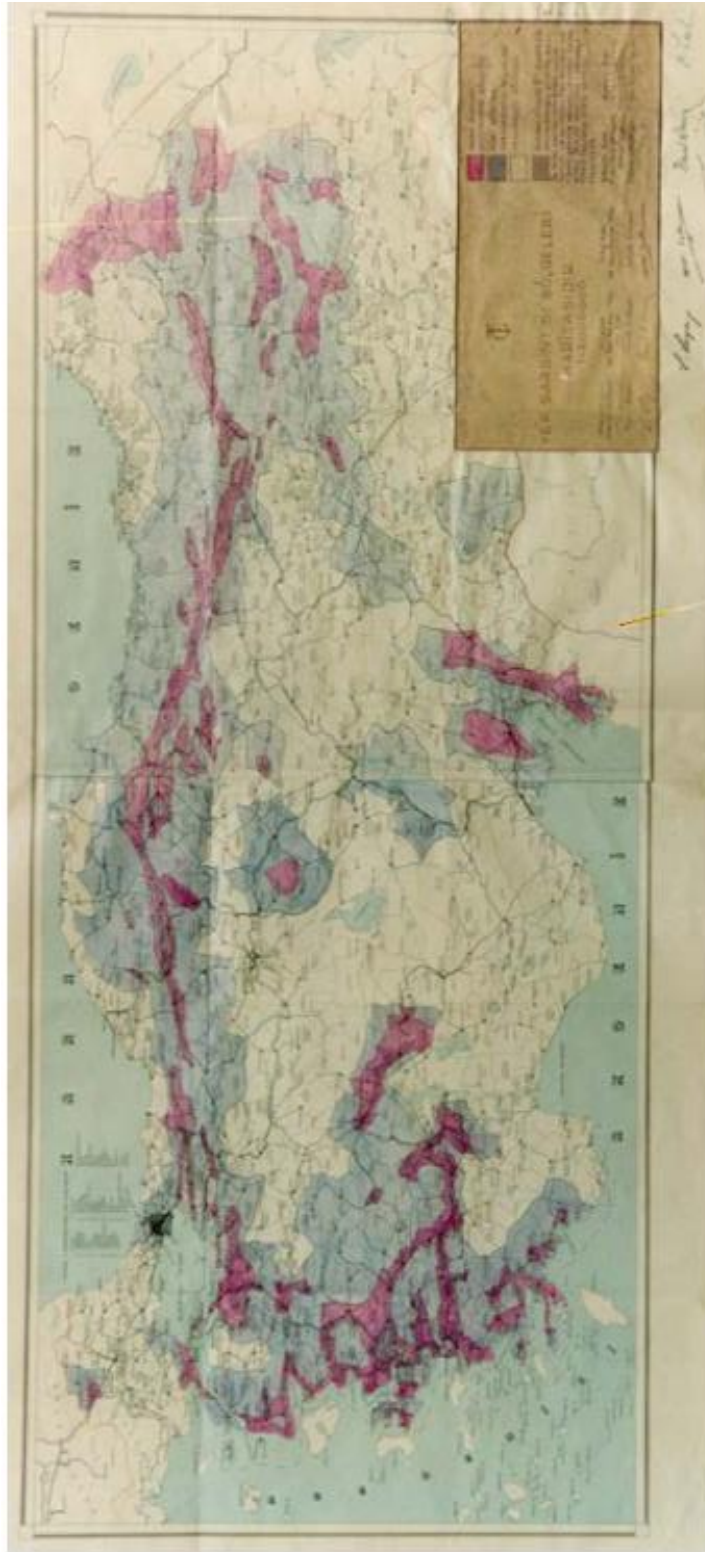
Muvakkat madde 1 — 1944 malî yılı Muvazenei Umumiye Kanunu-na bağlı (D) işaretili cetvelin Maarif Vekilliği kısmındaki iki adet 7 ve bir adet 14 lira ücretli yabancı memleketlerdeki talebe müfettişliği kâ-tipliği kadroları kaldırılmış ve bu kanuna bağlı (4) sayılı cetvelde yazılı kadrolar aynı cetvelin Maarif Vekilliği kısmına eklenmiştir.

APPENDIX 2: First Earthquake Zones Map of Turkey in 1945



Source: AFAD Archives, Pampal and Özmen, 2007

APPENDIX 3: Earthquake Zones Map of Turkey Revision in 1947



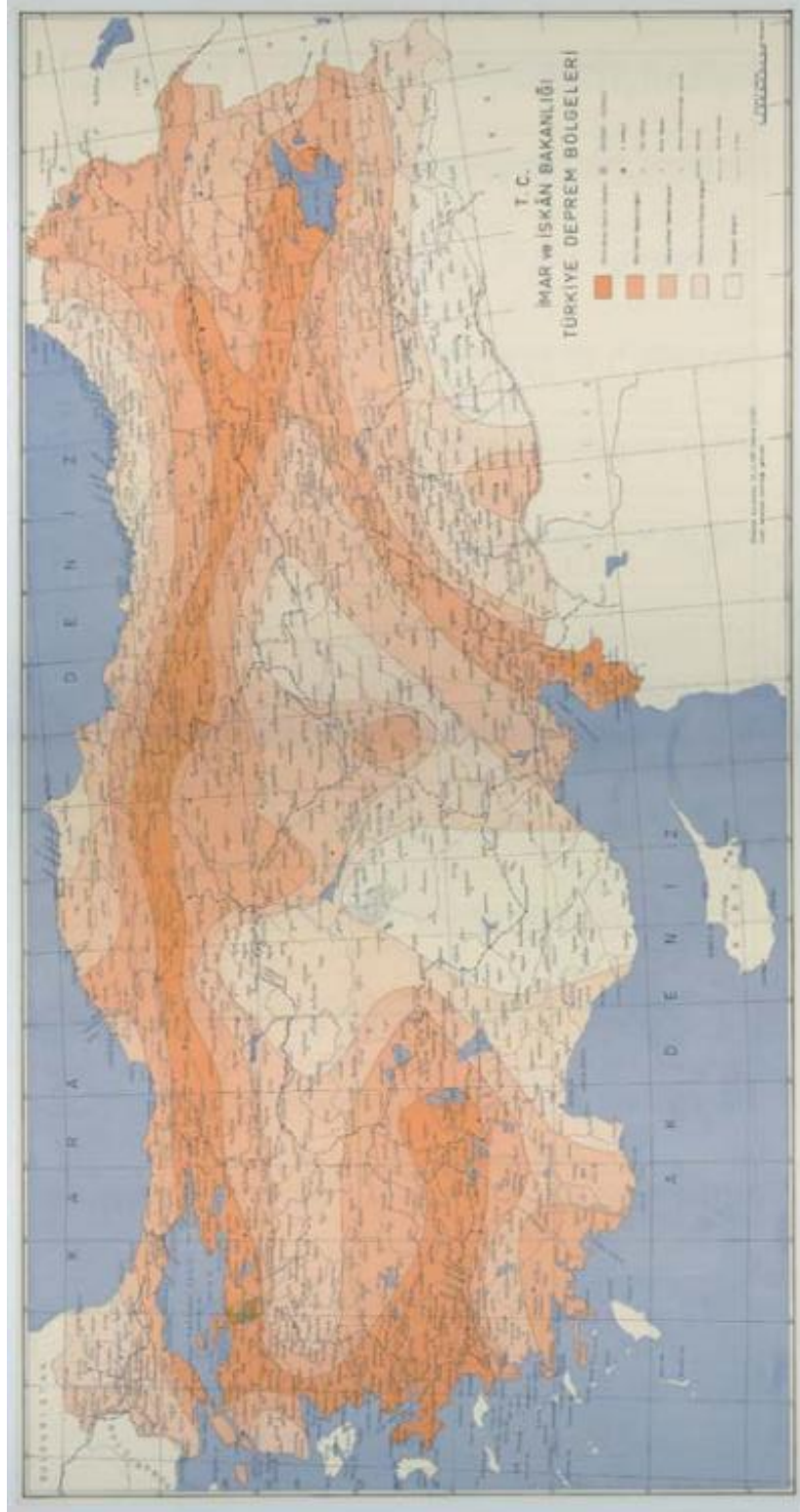
Source: AFAD Archives, Pampal and Özmen, 2007

APPENDIX 4: Earthquake Zones Map of Turkey Revision in 1963



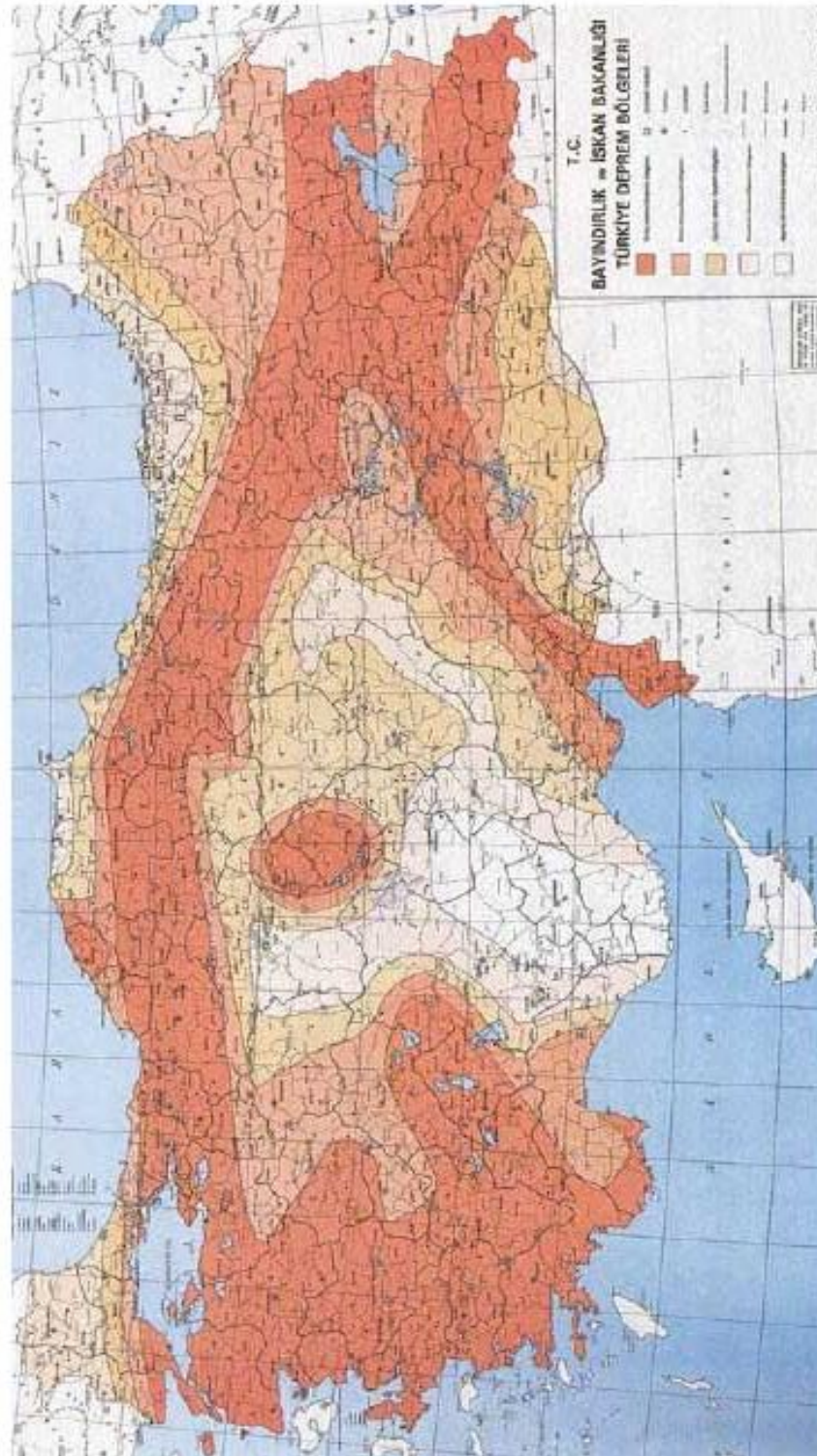
Source: AFAD Archives, Pampal and Özmen, 2007

APPENDIX 5: Earthquake Zones Map of Turkey Revision in 1972



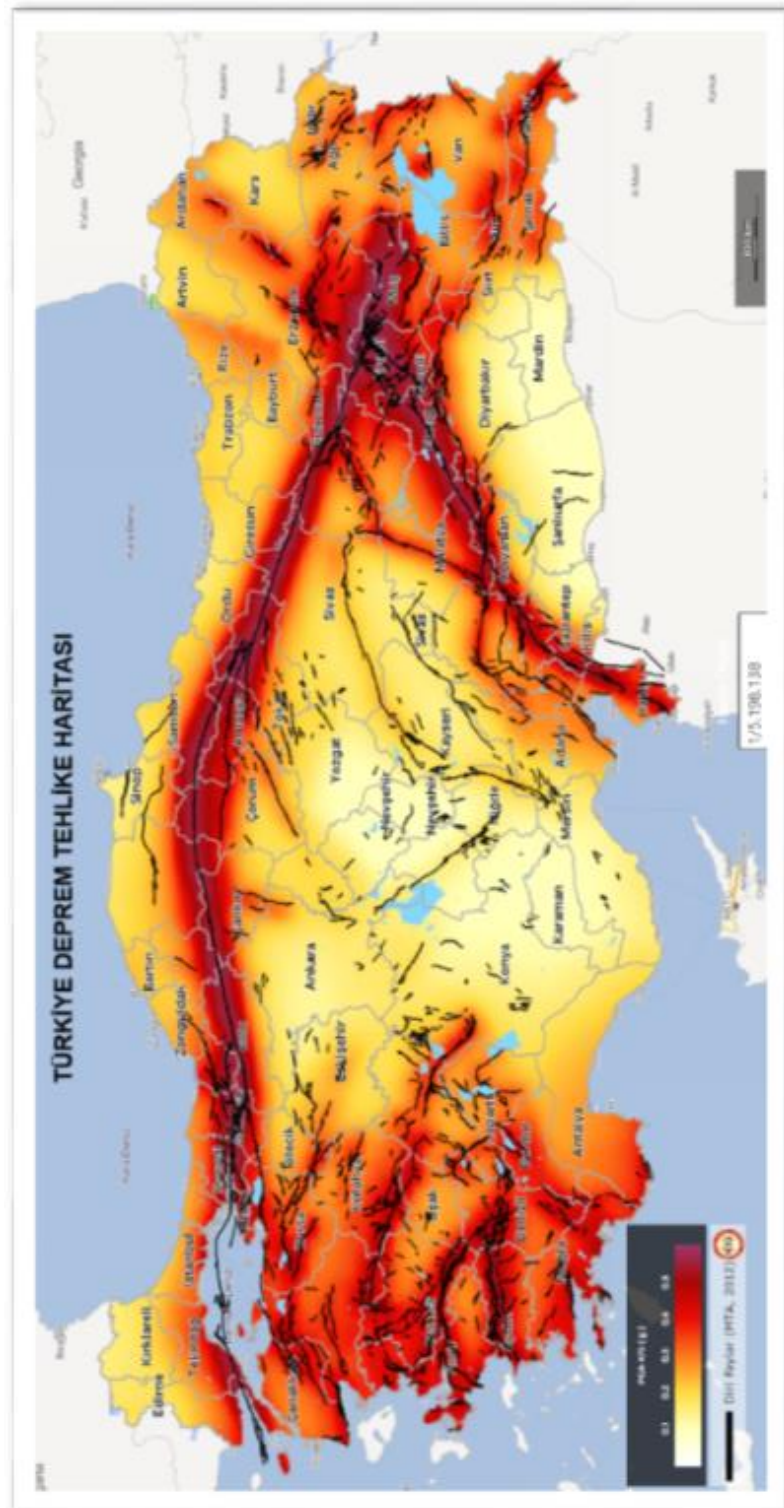
Source: AFAD Archives, Pampal and Özmen, 2007

APPENDIX 6: Earthquake Zones Map of Turkey Revision in 1996



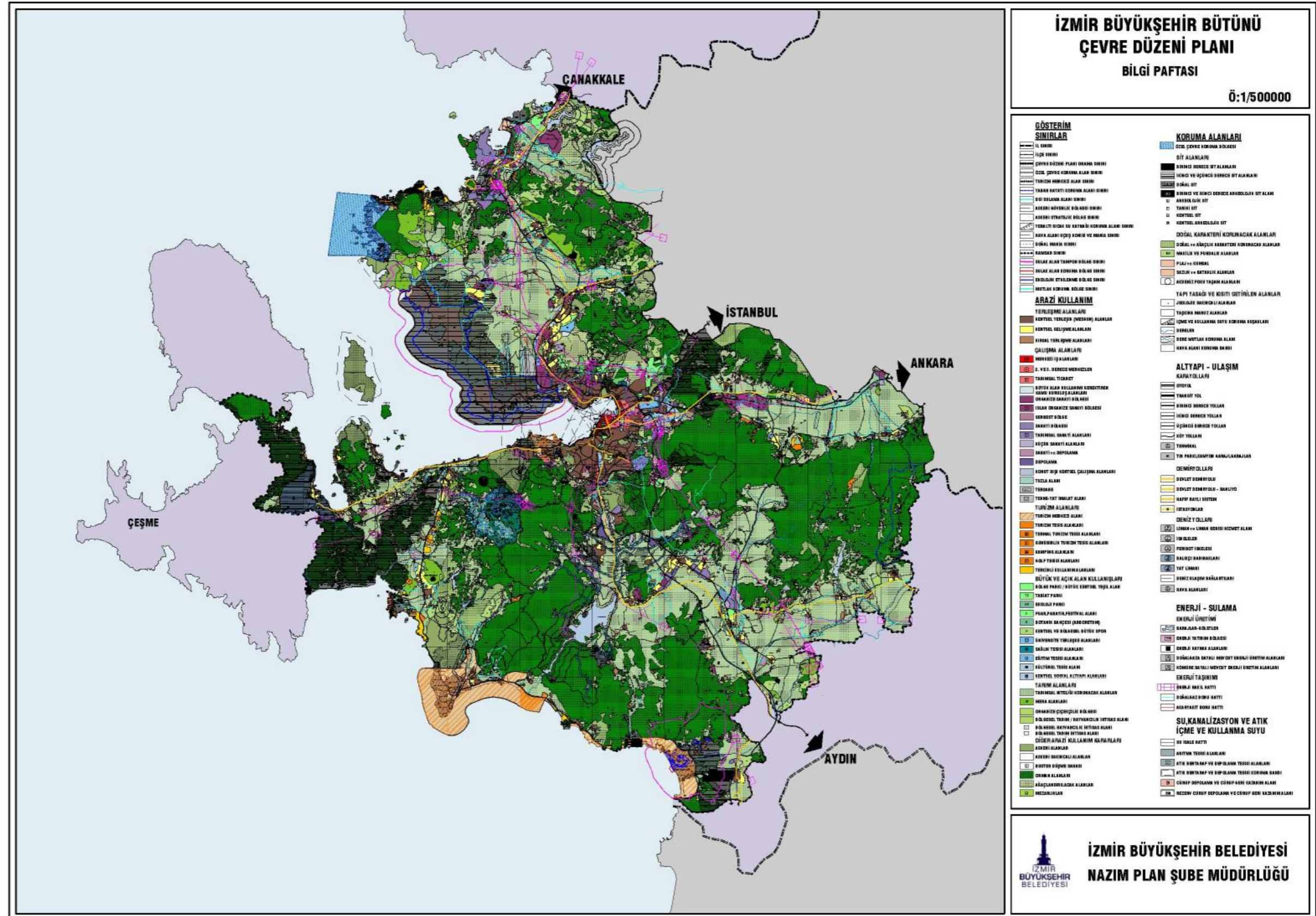
Source: AFAD Archives, Pampal and Özmen, 2007

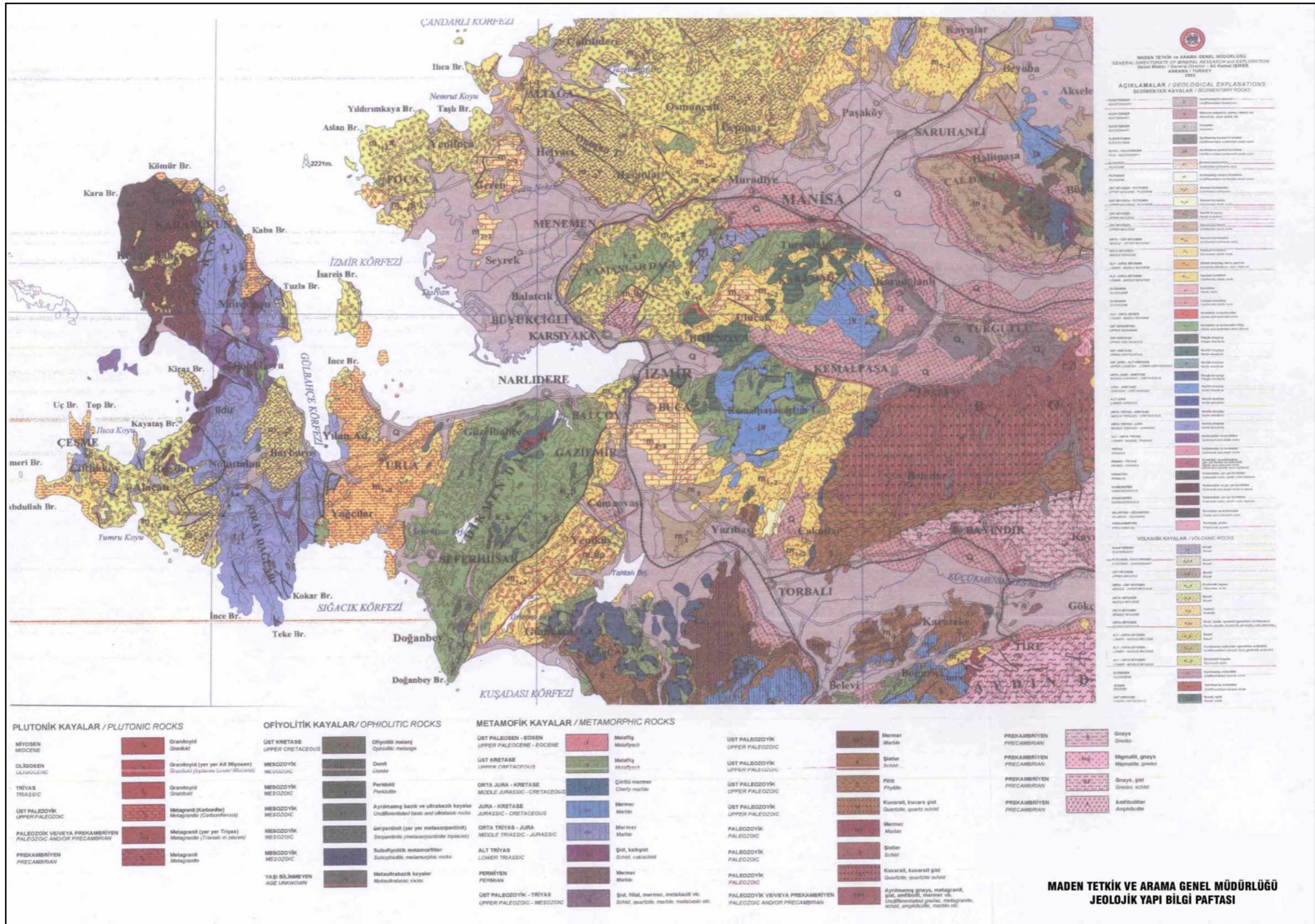
APPENDIX 7: Earthquake Zones Map of Turkey Revision in 1996



Source: AFAD Archives

APPENDIX 8: The Environmental Plan of İzmir Metropolitan Municipality, 2012





Source: İzmir Metropolitan Municipality Archives, Plan Report

6.34. Afete Yönelik Hükümler

6.34.1. İzmir Kentsel Bölge tümüyle 1. Derece Deprem Bölgesinde kaldığından tüm alanda "Deprem Bölgelerinde Yapılacak Yapılar Hakkında Yönetmelik" hükümlerine uyulması zorunludur. Ayrıca bu plan kapsamında kullanım kararı getirilen alanlarda

ilgili idarelerce nazım ve uygulama imar planı yapım aşamasında, ilgili mevzuat uyarınca jeolojik/jeoteknik ve jeofizik etütlerin yapılması zorunludur.

6.34.2. Hazırlanacak jeolojik/jeoteknik ve jeofizik etüt raporlarına göre sıvılaşma riski yüksek, yapı yasaklı alan olarak tespit edilen alanlar, hiçbir şekilde yapılaşmaya açılmayacaktır.

6.34.3. Bu planın onay tarihinden önce imar mevzuatına uygun olarak imar planı yapılmış olmasına rağmen uygulama (yapı) yapılmamış alanlar, jeolojik/jeoteknik ve jeofizik etüt raporlarına göre afet (sıvılaşma, heyelan vb.) riski yüksek, yapı yasaklı alan olarak tespit edilirse, bu alanlar (parsel ve/veya parseller) plan değişikliği yapılarak jeolojik sakıncalı alana dönüştürülecektir.

Bu planda büyük Kentsel Yeşil Alan olarak belirlenmiş alanlar afet sonrası geçici kullanımlara yönelik rezerv alan olarak ayrılmıştır. Bu alanlar plan değişikliğine konu edilemez.

6.34.4. Bölgesel olarak ilgili Kurum ve Kuruluşlarca yapılacak olan enerji, iletişim, ulaşım ve benzeri altyapılar ile doğalgaz boru hatları ve tesislerinde, jeolojik/jeoteknik ve jeofizik etüd raporlarına uyularak gerekli güvenlik önlemleri alınacaktır.

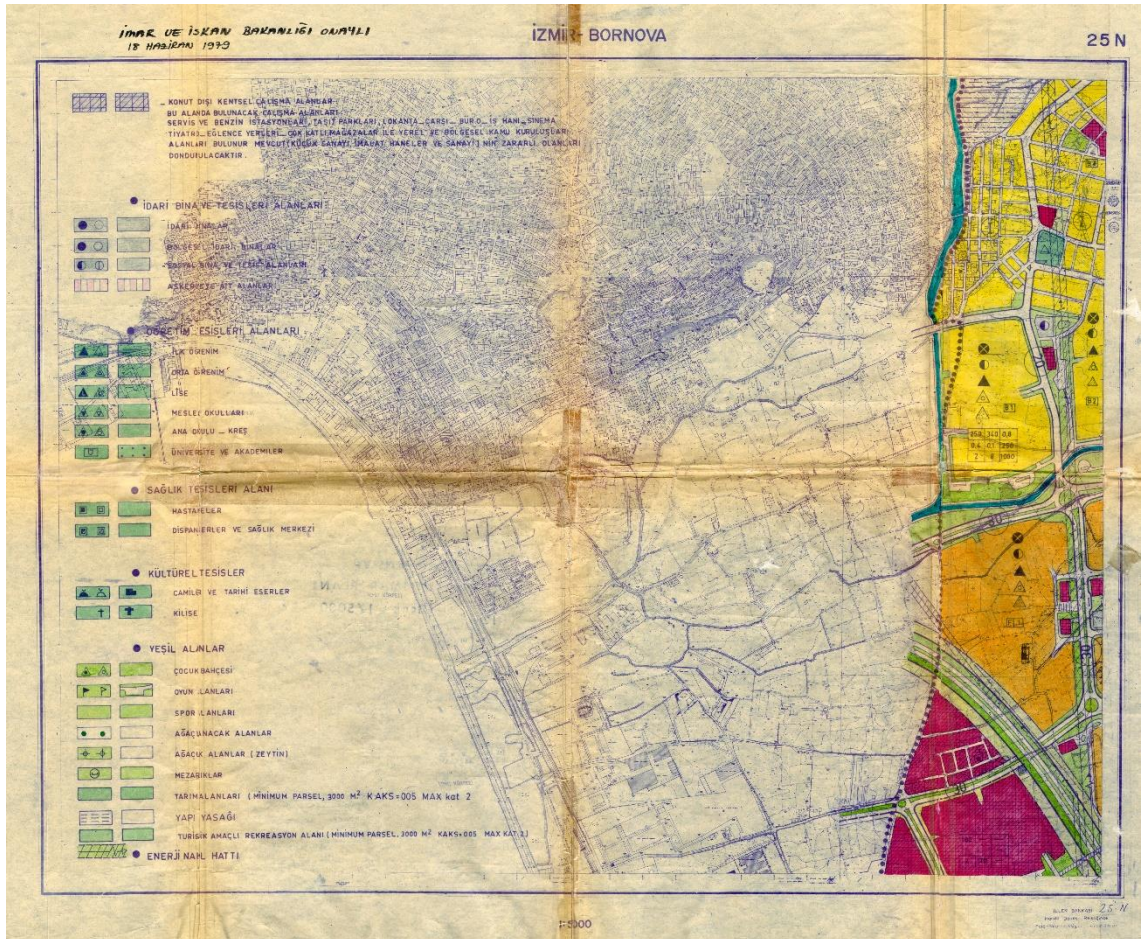
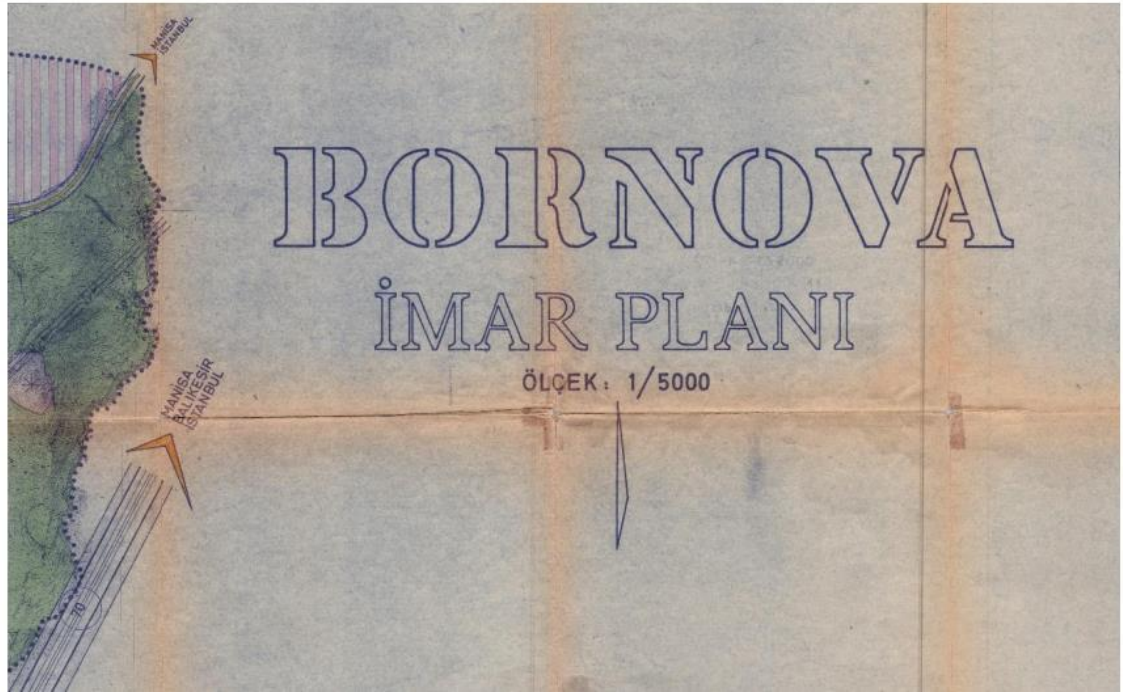
6.34.5. İmar planlarında yeni oluşturulan ana yolların genişlikleri afet sonrası trafik akışını engellemeyecek biçim ve genişlikte belirlenecektir.

6.34.6. Kentsel alan içerisindeki bütün kamusal açık alanlar afet durumunda toplanma alanı olarak değerlendirilecektir.

6.34.7. Alt ölçekli planlama çalışmalarında, planlanan nüfusa göre afet sonrası acil yardım ve destek merkezi, afet yönetim merkezi, acil müdahale merkezi ile toplanma alanları belirlenecektir. Ayrıca, afet hasarlarını azaltmak ve can kayıplarını en aza indirmek için erişilebilir noktalarda yerel tahliye alanları ve toplanma yerleri olarak kullanılacak yeşil alanlar, parklar, rekreasyon alanları, spor alanları vb. büyük açık alanlara sahip donatı alanları oluşturulacaktır.

Source: İzmir Metropolitan Municipality Archives, Plan Annotations

APPENDIX 9: 1979 Approved 1/5000 Scaled Master Plan Details



ÖZEL İŞARETLER

* SINIRLAR

- BELEDİYİ SINIRI (İSKAN SINIRI)
- ÖZEL KİMLİLİK BÖLGELER SINIRI
- SİT ALANI
- BECEKÖYÜ ÖNLEME BÖLGESİ
- S.K.A. SOSYAL KONUT ALANI
- YAPI YAYILAMA SINIRI

* ULASIM

- OTO YOL
- EXPRES YOL
- ANA YOLLAR
- BENZİN VE BAKIM İST. TERMINALLER
- OTOBUS DURAKLARI
- OTOLARLAR
- D.B.Y. YOLLARI ALANI
- D.B.Y. TOPLU TAŞIM DURAK YERLERİ

* BÖLGELER

* KONUT ALANLARI

- BİRİM YÖNÜNLÜK 20 KI./HA.

300 070 0 8
0 4 07 03
2 4 150
- BİRİM YÖNÜNLÜK 25 KI./HA.

300 130 12
0 4 07 03
2 4 150
- BİRİM YÖNÜNLÜK 30 KI./HA.

300 190 15
0 4 07 03
2 4 150
- BİRİM YÖNÜNLÜK 35 KI./HA.

300 250 18
0 4 07 03
2 4 150

* NÜFUS YÖNÜNLÜĞÜ VE YAPI DÜZENİ KORUNACAK ALANLAR

* NÜFUS YÖNÜNLÜĞÜ VE YAPI DÜZENİ İSLAH EDİLECEK ALANLAR

* ÇALIŞMA ALANLARI:

* İZMİR BÜYÜK KENT BÜTÜNÜ METROPOLİTEN MERKEZİ:

* İZMİR BÜYÜK KENT BÜTÜNÜ METROPOLİTEN MERKEZİ (DANIL):

* BU İLÇEDE SERVIS VE BENZİN İST. TERMINAL - TAŞIT PARKI - LOKANTA - BÜRO - ÇARSI:

* SİNEMA - TİYATRO VE EĞLENCE YERLERİ - ÇOK KATLI MAĞAZA VE İSKAN BULUNUR:

* İSKAN ÜNİTESİ TİCARİT (K.A.K.S. - Z) MAX. F.A.K.S. 970:

- İSKAN ÜNİTESİ BRÜT NÜFUS YÖNÜNLÜĞÜ KI./HA.
- YAPI ADASI NET NÜFUS YÖNÜNLÜĞÜ KI./HA.
- KAT ALANI KAT SAYISI (K.A.K.S.)
- TABAN ALANI KAT SAYISI (T.A.K.S.)
- ZARFI ALANI KAT SAYISI (Z.A.K.S.)
- MINİMUM PARSEL ALANI (m²)
- MINİMUM KAT ADEĐİ
- MAXİMUM KAT ADEĐİ
- MAXİMUM KATA GÖRE MİN. PARSEL ALANI (m²)
- A.1. İSKAN ÜNİTESİ NÜKRASİYAT KURULUŞU RAPORUNA (BKZ.)

- BİR İSKAN ÜNİTESİ DONATIMI
- ARAZİ KULLANMA KARARLARI VE
- ÜNİTE NÜFUSUNA GÖRE BÜYÜKLÜKLERİ
- 1/5000 ÖLÇEKLİ PLANLARDA
- SAPTLANACAKTIR

1:5000

17 Haziran 1979

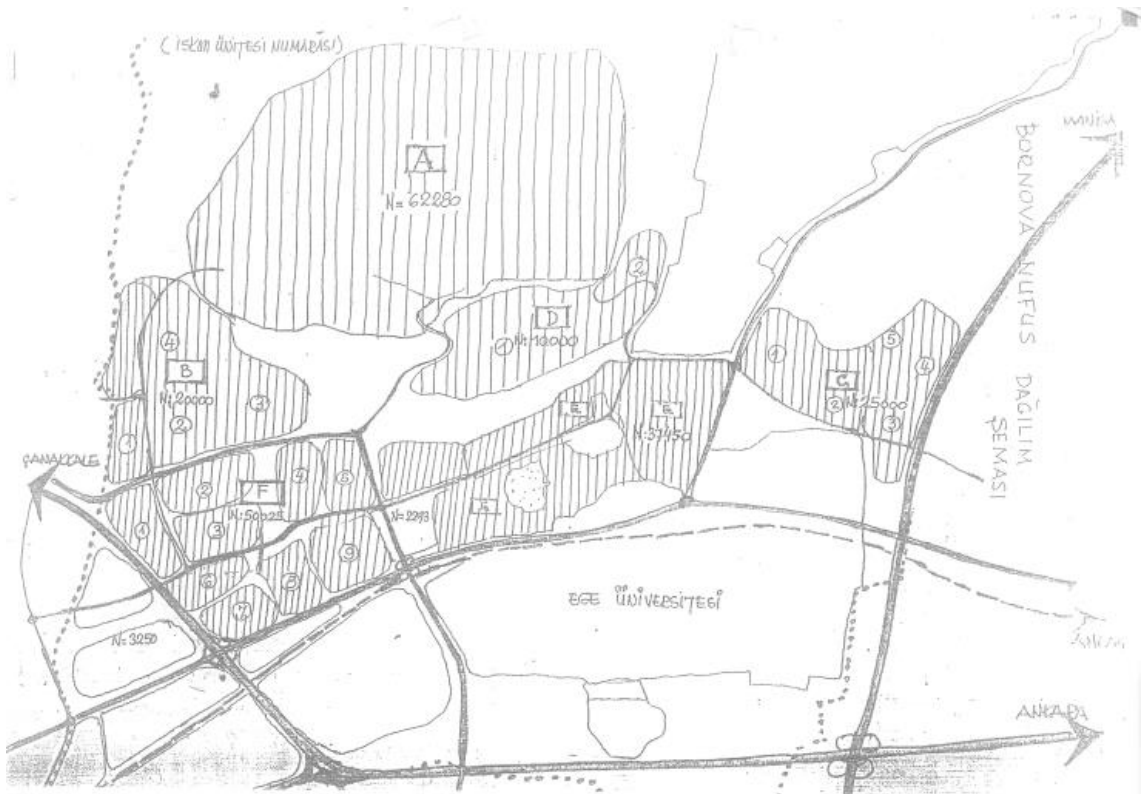
* DİĞER HUSUSLAR

- DEPREM YÖNETMELİĞİ KOŞULLARI UYGULANACAKTIR.
- ÇATI KATI YAPILAMAZ
- MESKUN ALANLAR İLE İNAR PLANINA GÖRE İRAZ GÖRÜNÜŞ ALANLAR
- YÜRÜRLÜKTEKİ YÖNETMELİK ESASLARINA GÖRE UYGULANIR. ANCAK BU KOŞUL
- 1:1000 LİK UYGULAMA PLANLARININ ONANMASINA KADAR GEÇERLİDİR.
- İZMİR BÜYÜK KENT BÜTÜNÜ METROPOLİTEN MERKEZİNDE (YÖNETİCİ MERKEZ + KONUT
- DIŞI KENTSEL ÇALIŞMA ALANLARI) KANUNİ TABANINDAN KANUNİ TESİSLERİ ALANLARI İÇİN
- KAMULAŞTIRMA KARARI (BU PLANA GÖRE) ALINIR.



BORNOVA BÖLGEÇİK SERVİSLERİ

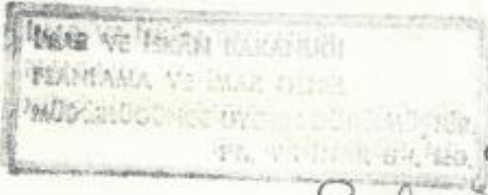
BÖLGE- ÇİK	NUFUS	BRÜT ALAN ha	BRÜT UNL. AL. TOR. ha	BRÜT YOĞUN. ki./ha	SERVİSLER					SERVİSER %65i servis/böl	ANA YOLLAR ha
					ORTA OKUL m ² /a	TİCARET m ² /a	KUL. EĞL. VE DİĞ. SER.	YEŞİL ALAN m ² /a	SERVİSER TOPLAMININ		
A	62280	806.98	522.95	774	34877	24772	16084	116540	26.55	620	9.20
B	20400	92.54	60	220	11200	2000	6600	40000	2.42	10.00	3.20
C	25000	110.5	70	225	10000	2000	2000	25000	10.45	9.70	3.60
D	10000	40	40	250	5000	1000	500	10000	7.2	9.10	1.80
E	32350	112.7	70.9	262	20900	7490	17000	17000	15.45	12.00	4.20
F	50025	184	152.1	249	26000	11000	15000	10000	20.43	11.00	10.40
Yüksek okul	2295	22.2	22.2	80	1200	400	200	1000	0.92	8.60	3.20
Ortaokul merkez	2450	10.2	10.2	65	1200	400	400	1000	1.28	2.90	6.80
Toplam toplam	210295	1607.60	1047.1	268	112767	75510	63070	116540	26.44	2.90	10.80





BORNOVA NAEİN İNAR PLANI
AÇIKLAMA RAPORU

- Planlamada Seçilen yöntem - Planlama ilkeleri
Kabul edilen NAEİN boyutuna (Alternatif IV) ve Yönelimlere
göre Yerleşme Bölgecikleri
- İnstr. B.K.B. nin Planlama kararları - Dekretözm Planlama kararları
- Bornova Planlama kararları
- Mükensel Projeksiyonlar (Planlama dönemi için)
- Mükensel olmayan Projeksiyonlar (Planlama dönemi için)
- Sektörlere göre arazi kullanımı (Kışi beçims kullandıs alanlara,
hina toplan alanları ve TÖs alanı ovaları)
- Yönetici Merkezi
- Sanayi - Ulaşım



[Handwritten signature]

Y. Mimar Bulent KEREKÇİ

Y. Mm. Mühendis

Melihat TOPALOĞLU

[Handwritten signature]
18 Haziran 1979

U L A Ő I N ..

Yolların Kademeleşmesi :

OTOYOL
EKSPRES YOL
TOPLU TAŞINIM OLARAK YENİ ÜSTÜ HIZLI (Elektrikli Tren)
DENİZ YOLU
KENTSEL YOLLAR

OTO YOLLAR :

İzmir ve Bölgesinin , Ekonomik , Sosyal , Kültürel ve Yönetim faaliyetlerinin yoğunlaştığı Metropoliten Merkezine , Bölgesel kentlerden , Uçdu kentlerden , ve diğer bölgelerden Ülkemsel fonksiyonları da yükümlenerek çabuk ve en emin biçimde ulaşmasını sağlıyorsa ;

- 1 - 1 Çanakkale - İstanbul , Öncey Anadolu kıyıları oto yolu ;
- 1 - 2 Bursa - Manisa - İzmir , Öncey kıyıları oto yolu ;
- 1 - 3 İzmir - Ankara oto yolu ,

Otoyollar Karayolları Genel Müdürlüğü'nün programındadır .

- 1 - 1 den 1 - 3 e öncelik verilmiştir .

Otoyolların en önemli fonksiyonları bölgeleri süratle birbirine bağlamak ve büyük merkezlere süratle ulaşabilmektir .

Otoyol'un yeni Liman ve çevresi , Hava limanı , Havaolu yolu limanı , Metropoliten merkez , Karayolları yolu istasyonu , Uçdu kentler , ve Bölgesel Kentlere giriş - çıkışları belirli noktalar da olmalıdır . Bunların dışında ilgili kurumların gereklidir .

Fiziki plan bu esaslara göre düzenlenmeli , Uygulama Ülkemsel ve Bölgesel gelişmeye paralel olarak kademeleşmeli yapılabilir . Ancak , arazi kullanma kurulları ile önceden gereken tedbirlerin alınması çok yerinde olur .

İstanbul - Çanakkale - İzmir otoyolu , Bölgesel yönetici merkezin kuzeydoğu - sudan teğet almak geçmekte , Bornova'nın güneyinden ANKARA otoyoluna bağlanmaktadır . İzmir - Ankara otoyolu , İstanbul - Bursa - Manisa - Antalya otoyol aksı ile Bornova'nın güneyinde (Işıkent'te) kesilmek üzere planlanmıştır .

Antalya - Mersin - Adana - İskenderun otoyolunun Çukurova projesi yapılmıştır .

Planın göre , otoyol üzerinde iki giriş-çıkış noktası bulunmaktadır . Biri - otoyol'u İzmir Yönetici Merkezine kuzeydoğu'dan teğet olarak geçmekte olan bölü - münde İzmir - Bornova girişi , diğeri güneyde Kuzey - Öncey otoyol aksı ile İzmir - Ankara otoyol aksının kesiştiği bölümedir .

BORNOVA 1/5000 ÖLÇEKLİ HAZİR İMAR PLANI

AÇIKLAMA RAPORU

Bornova , İzmir Büyük Kent Bütünü bir parçası olarak kabul edilmiş , (Ülkesel Bölgesel , ve kentsel fonksiyonlardan kendisine isabet edenleri yerine getirmek üzere İzmir Metropoliteneinin Makroformu içindeki yerine oturtulmuştur.

Çalışmaların 1. Bölümünde ;

- . Araştırmanın amaç ve yöntemi ,
- . Bornova'nın tarih boyunca oynadığı rol, konumu ve bölgesindeki etmenler irdelenmiş , Ülke içindeki yeri, içinde bulunduğu bölge ve alt bölgenin yapısal özellikleri, kentsel kademelenme ve nedenleri, çeşitli fonksiyonlara göre kentin etkilendiği yerleşme ve alanlar, kentin ülke ve bölgedeki yeri, dış veriler, bağışa ait politika kararlar ve bunların kente etkileri ,
- . Bornova'nın sosyal , Ekonomik ve Demografik yapısı, kentin mekansal yapışını biçimleyen etmenlerin niteliksel ve niceliksel özellikleri, kentin kurulduğu ve büyüyeceği alanın fiziksel özellikleri , kenti biçimleyen fiziksel veriler,
- . Çeşitli kullanım alanları , bunların bağlantıları , alt yapı ve ulaşım ilişkin sorunlar ,
- . Sosyal , Ekonomik , Demografik ve Mekansal yapıya daha önceki çalışmalarla belirlenmiş olan kentin , bugüne kadar geçirdiği plan tecrübeleri , gerçekleştirme dereceleri ve nedenleri , yeni planın gerek bölge gerekse planlama amaçları yönünden uygulanması olasılıkları irdelenmiştir .

Çalışmaların 2.öl Bölümünde ;

Toplanmış olan Sosyal , Ekonomik, ve Mekansal verilerin değerlendirilmesi ve Harita Plan gerektiren temel teşkil edecek olan sınırların belirlenmesidir.

Amaç kentin Makroformunu belirleyecek yeni arazi kullanımını sağlayacak olan değişikliklerin teşbitidir . Kentin gelişme alanlarını ve gelişme biçimini etkileyen sınırlayıcılar, bu sınırlar konusunda sağlıklı kayıtlardır .

B O R N O V A

(Üç Araştırma Cilt 1 , Cilt 2)

EKSPRES YOLLAR :

Otoyol şebekesinden sonra ikinci derecedelik yol olan Ekspres yollar Bölgesel Yönetici merkez ile Konut Bölgeleri arasında geçmekte, Karayolu ve Deniz Yolu ulaşım istasyonları ile ilişki kurmakta ve kentel ana artere bağlanmaktadır. İzmir B.K.B. sını geçitli bölgelerinden Çalınan alanlarına , bölgesel yönetici merkeze süratli ulaşım ve otoyol ile kentel yollar arasındaki bağlantıya sağlanak amacıyla geçen Ekspres yollar da önemli kavşaklar alt - üst geçitlerle güçlendirilmiştir , Kentin ana arterine , fazla yükünden Ekspres yolla otoyolum kesildiği kavşaktan girilmektedir .

Konaklar - Torbalı Ekspres güzergahı bulun duble olarak yapılmaktadır . Duble olarak uygulanmakta olan Konaklar - Cuma ovası yolu ile Bornova - İzmir yolu Ekspres yol karakterinde olmaktadır .

Bayraklı - Karşıyaka , Çanakkale - Üsküdar , Çukurova kıyısı - güney ana kentin iç ve Konut alanlarını boydan boya keserek , Vapur yolu istasyonu ve Otogar'a ulaşmaktadır .

Toplu taşımanın için Deniz yolundan ve Deniz Ulaştırından yararlanmak için Elektrikli Tren şifri , Körfez ulaşım organizasyonu edilmeli , gerekli araştırmalarla iskale yerleri , işletme sorunu , Vapur , Tren , Otobüs kombine bilet ve süratli ulaşılabilirlik olasılıkları araştırılmalıdır .

Toplu taşıma araçlarından faydalanma olanağının bulunduğu konut alanlarında fakat yoğunluğu daha yüksek tutulmalıdır .

KENTSEL YOLLAR :

Bornova'nın mevcut merkezi ile Üsküdar Yönetici Merkezini iki kademe , iç ve Ticaret merkezini İzmir Metropolitan Aktivite bölgesine bağlayan ana arter ile ,

Yeni Yönetici merkezinin batısında , Ekspres yoldan Bornova'ya girişi sağlayan kavşakla kıyıdaki ve batıdaki konut bölgelerini birleştiren ana arter kentin en önemli ulaşım şifri olacaktır .

Kent içi trafiğinin , kent dışına aktarılabilmesi noktalar yeni Ekspres Yollarla , yer üstü metrosu niteliğindeki Banliyö tren güzergahı üzerindeki Toplu taşıma istasyonları planında belirtilmiştir .

PLANLARDA SEÇİLEN YÖNTEM . .

Bir Planın Başarıları :

Büyük ölçüde dinamik olması ve - Kullanılan kavramların , tarandırebileceği nüfusun doğru seçilmesine ve , - plan amaçlarının doğru saptanmasına bağlıdır .

Yapılan üç çalışmaları , Amalî ve Sentezlerle , Bernova'nın toplumsal , Ekonomik, ve Mekansal yapısı incelenmiştir .

Planlardaki Tesel Kabul :

Mekansal organizasyon ve yapının, Sosyo-Ekonomik yapının mekandaki yansıması olduğudur . Diğer bir deyişle , Mekansal örgüt ve yapı , Sosyo - Ekonomik yapı tarafından biçimlenir ve birlikte evrim geçirir .

Sosyo-Ekonomik yapıdaki herhangi bir değişiklik , ne kadar kısa sürede yansır. Bu yansımalar Sosyo-Ekonomik yapısal değişimin evrim yapısına ve yoğunluğu etkilemesi, değişen evrim yapı ve yoğunluğunda mekân biçimlendirmesi biçiminde olur .

Gerekli bilgilerin toplanması işlemi, bu varsayımlar çerçevesinde başlanıp kenti etkileyen ve bugünkü formunu biçimlendiren nedenler, fiziksel ve Sosyo-Ekonomik sentezlerle değerlendirilmiş ve planlamaya esas olacak kararlar alınmıştır. Bir kentin planlama yöntemi ve tekniklerinin , kentin dinamik yapısını, bugünkü ve gelecekteki biçimsel yapılarına , yani bağimsız değişkenleri , planlamaya kente katan olarak istediği hususlara igrasını gerektirir .

Kent planlamasının a verilen birçok karar, kabul edilen standartlar , değişik Ekonomik aktivitelerde gelişmelerin tüm saptama ve bunların ekonomik faaliyet kollarına arzındaki değişim eğilimlerine ve planlama hedeflerine göre verilmiştir .

Değişik kollarde gelişmelerin sayısında görülen artış yada değişimlerin nedenlerini araştırma yada değişimler üzerinde yorum yapma yolu tutulmuş , b u durum kontrolden ve bilimsel iştir Metropolitik Yönetici Merkezine yakın olma - nın sonucu olarak kabul edilmiştir .

Dinamik Planlamadan Anlaş 100 :

Kentin tahmini edeceği ölçüleri aşmadan , yani içinde yaşayanların yaşama - çalışma - eğlence sonunda ve dinlenme - ulaşım fonksiyonlarına sorunsuzdan yerine getirebilin , büyük kentin olanaklarından yararlanan karşılığında tesis havasını feda etmeyeabilen , planlama dönemi içinde olduğu kadar , planlama dönemi dışında da günün gelişen gereksinimlerine , o günkü koşullarla ve o günkü araçlarla uyum getirebilecek bir sınıra hazırlamak , yani bu esneklikte bir plan yapmaktır .

Dinamik bir planlama sözkonusu olduğuna göre , İzmir Planlarına hiçbir zaman bitmiş , kesinleşmiş ölçüyle bakılmaması gerekir . Nüfusun belirli dönemlere yaklaşması , veya planlandığı sınırlarda baskın konuları olmayan problemler ve temayüller sezildiği anlarda kent bütünüyle ele alınıp gereken kontrol ve ilavelerle ölçümler araştırılmalıdır . Ancak , kent , hiçbir zaman sonuna kadar büyüyeabilen bir organizme değildir . Özellikle Bornova .

Bir kentin bir büyüme kapasitesi vardır (Yayılma alanı) . Bu kapasite zorlandığında ve aşılmak istenildiğinde bir kent ortaya çıkar .

Hava kirliliği gibi problemler sadece iyi seçilmiş ve iyi yönlendirilmiş v.b. yerleşmelerin sonucu değil , yoğunluğu kontrol edilmeyecek kadar yüklenmiş kentlerin de eseridir .

Önemli olan kentin içindeki bütün boş alanların alabileceği azami nüfus değil , kent makroformu içinde yaşayabilecek olan nüfusun ölçüsün altında kalması gerektirir . Yani mevcut kentin dengasını bozmadan , hizmet yeteneklerini yitirmeden , hava kirliliği gibi sonuçları çok güç olan tehlikeler yaratmadan , Bornova nüfusu için gelişme tavanını (Aşmaması gereken nüfus boyutunu) saptayabilmektedir .

Berçaydan önce Bornova müstakil bir yerleşme değildir . İzmir B.K.B.'nin hemde kent örneğine çok yakın bir parçasıdır . O kadar ki Bornova'nın batısında Beşlediye hudutları içerisinde kalan bir bölümlü İzmir Metropolitan Yönetici Merkezinin alanına katılmıştır .

Bornova , büyük kentin sorunlarına , ulaşım v.b. gibi avantajları vb. nedenlerle , tercih edilen bir yaşama alanı olarak yoğunlaşma eğilimindedir .

Kentin Ermişleri Mükemmel Dört Nüfus Boyutu :

Nüfus - 299.500 - 256.500 - 230.000 - 220.000 + , kabullerinden hareketle dört alternatif oluşturulmuştur .

Normal durumdaki planlama çalışmalarında herne kadar nüfus boyutunun yüksek tutulmasından çekinmek gerekirse de (Esnak olsa bu değere , planlamada öngörülen zaman sürecinde olmasa bile belirli bir yıl sonra ulaşabileceği düşünüldükçe) yüksek tutulan değerler , unutulmayan gelişmelerin sonuçlarına cevap vermeyi kolaylaştıracağı gibi alt yapı ve benzeri konularda kurgulanacak teknikliklere öncelik vermesi ,

Eğer seçilen planlama yaklaşımı aktif bir planlama yaklaşımı ise , uygulayıcıların emekliliğini ve pazarlık gücünü artırması , v.b. nedenlerle ,

Bornova da durum çok farklıdır . Nüfusu en yüksek aşamada tutmak , yoğunluğu çok fazla yükseltmek ve sonunda çok kısıtlı olan gelişme alanlarında gereğinden fazla sosyal - alt yapı (Okul , Park , Çocukbahçesi vb.) rezervi yapmaya gerektirir. Bu maksatla ayrılmış olan alanları önceden satın alma olanağı olmayınca da koruyabilmek uygulamasında büyük güçlükler çıkarabileceğinden , planın tedilat için zorlanması , kanvasus yapı yapma isteğinin artmasına sebep olabilir .

Teknik alt yapıya da gereksinimlerin altında yapmak ne kadar hatalıysa , zamanından önce yada gereğinin üstünde yapmakta o kadar hatalı olur .

(En sonunda bütçe meselesidir ve önce yapılmış bazı tesislerin ihtiyag duyulacağı etkinliğe hale gelebilmesi demektir.)

Bornova Huzun Plan Genesi araştırma - tesbit ve proje çalışmalarında kentleşme ve planlama operasyonları açısından dört farklı nüfus kabulüne göre 4 alternatif oluşturulmuştur .

Bornova için gelişme olanağı olan alanlar arasında tercih yapmak , yada gelişme alanlarının büyük yada küçük oluşumu tartışmak , bir meteorolojik ilkeler açısından derecelendirmek kastedilen alternatifleri irdelenmek söz konusu değildir .

Bornova da planlanacak olan alan Doğal ve Yapay sınırlayıcılar ile son derece kısıtlanmıştır .

Kentin makroformu , Belediye hudutları içinde topografik ve terimsal enklavlarla Üniversite alanları arasında kalan tüm alanı kapsayacaktır .

Bornova'nın gelişme alanı bu sınırlar içerisinde planlanmamış olan alanlarla , mevcut alanlar içindeki boşluklardır .

Planlama dönemi için öngörülen nüfus , yaşama için en uygun yoğunluk seçildikten sonra , Bornova'nın alabileceği nüfustur . Yani kentin esaslı nüfus barındırabilme kapasitesidir .

Büyük kentin çok yakın bir yerleşmesi olan Bornova'da yoğunlaşma eğilimi çok fazla olduğundan şimdiden yüksek yoğunlukla bir planlama bu eğilimi daha da artırabilir ; Dört nüfus boyutuna göre getirilen 4 alternatiften nüfus için önerilen 4.08 alternatif tercih edilmiştir . (Araştırmalar 2.ci cilt)

Bir kentin planlanmasında gelişme dönemlerini yıllara göre seçerken genellikle gelişme oranı yüksek olan ve dalgalanmalar gösteren kentlerde - yıl ve varılacak nüfus boyutu - paralel gitmekte , hazırlanmış olan plan sürecini hedef alınan yıldan önce doldurebilmektedir .

Planın yeniden gözden geçirilme aşaması , varılacak yıl değil , yaklaşmış olduğu nüfus boyutu olmalıdır . Bilhassa eldeki veriler ve sosyal değerler usak bir gelecekteki sayıda yakın bir gelecek için yeterli olduğu sanan planlama dönemlerini nüfus boyutlarına göre ayarlamak daha gerçekçi olur . Bornova'da durum böyledir .

Sonuç olarak ; Bornova için hedef alınan nüfus boyutu 210.000 kişi. Planlama dönemi sonu , kent nüfusunun 210.000 e eriştiği yıldır . (Yada 1995 yılıdır .)

Seçilen Yoğunluklar : 200 kişi/ha. - 200 kişi/ha. - 300 kişi/ha. - 350 kişi/ha. dır .

Kontrol alan hisli alanın aşamalı ayarında 6 bölgeden oluşmaktadır .

Bölge	Nüfus	Yoğunluk
A	60.000	Yo. 200 kişi/ha
B	20.000	Yo. 250 kişi/ha 4 ünite (ilkokul birini)
C	25.000	Yo. 250 kişi/ha. 5 ünite
D	10.000	Yo. 250 kişi/ha.
E	45.000	Yo. 300 kişi/ha.
F	50.000	Yo. 300 - 350 kişi/ha. 9 ünite (ilkokul)

Gecekondu Ünlene Bölgesi , planlandığı amaçla göre uygulanabilirse , yani 2 katlı evlerin tek sınıflık evler olarak korunması (Her katte ayrı iki aile oturabilecek biçimde kullanılırsa yoğunluk iki katına çıkabilir ve sosyal alt yapı yeterli duruma düşebilir) v.b. koruyucu hükümlerle A bölgesinde yoğunlaşabilecek nüfusu 60.000 limitinde tutmak mümkün olabilir ve korunulur .

Toplu taşımanın araçlarına yakın yerleşimlerde daha yoğun yapı düzeni oluşturulmak için bu alanlarda nüfus yoğunluğu daha yüksek tutulmuştur. (E bölgesinde 45.000 , F bölgesinde 50.000)

MEKANSEL OLMAYAN PROJELERİN İZLENİMLERİ

YATIRIMLARIN İZLENİMLERİ

NÜFUS : 1977 43.956 1980 57.046 1985 88.899 1990 135.176 1995 210.000

Yıl	Nüfus
1977	43.956
1980	57.046
1985	88.899
1990	135.176
1995	210.000

İki dördü PROJELERİNİZLENİMLERİ

1977 % 1980 % 1985 % 1990 % 1995 %

YATIRIM	1977	1980	1985	1990	1995
T A R I H	235 1.8	282 1.6	393 1.4	532 1.2	717 1.1
İNHALAT SANAYİ	4499 14.2	5732 12.5	8329 29.7	11878 26.8	17201 24
ELEKTRİK-ŞEBE	58 0.4	71 0.4	140 0.5	266 0.6	592 0.7
TİCARİT-BANKA-SİGORTA	1117 8.5	1499 8.5	2496 8.9	4122 9.3	6880 9.6
ULAŞIM-İNSPOLAMA	501 3.8	705 4	1173 4.2	1950 4.4	3297 4.6
HİZMETLER	6730 51.2	9347 51	15508 55.3	25617 57.8	43075 60.1
T O P L A M	13143 100	17636 100	28944 100	44320 100	71672 100
N Ü F U S	43956	57046	88899	135176	210000
ÇALIŞAN NÜFUS ORANI (%)	29.9	30.5	31.5	32.8	34.1

İZMİR KENT BÜTÜNÜ

PLANLAMA KARARLARI :

İ.E.P.B. tarafından düzenlenen İzmir Büyük Kent Bütünü 1/50 000 ölçekli makroform kararlarına göre ;

- Bornova'nın 1995 nüfusu 210.000 kişi uygun görülmüştür .
- ANKARA - İZMİR ve İSTANBUL - İZMİR Otoyolu Bornova'nın güneyinden geçilecek ve mevcut güzergah kent içi ana arteri olarak tanımlanacaktır .
- Ovadaki 1. sınıf tarım arazisi mümkün olduğu kadar korunacaktır .
- Üniversite alanının daha fazla büyümesi düşünülmektedir .
- Gecekondu Bölgesi (Atatürk Mahallesi) esaslı plan kararları doğrultusunda bir yerleşme alanı olarak kullanılması gerekmektedir .
- Mevcut İmar Planı Alanlarında da genel kurargaha göre değişiklikler yapılması olumlu olacaktır .
- Bornova Sit koruma ve geliştirme planlarını müellif İ.E.P.B. ve diğer ilgili kuruluşlarla ilişkili olarak hazırlanacaktır .
- İZMİR - MANİSA - İSTANBUL yolu bugünkü kavşaktan kaydırılacak daha doğru olacaktır .
- Geleceğin İZMİR - ANKARA ekspres demiryolu , Bornova demiryolu bağlantısının devamı olarak Belkışbove , tünelle Kemalpaşa'ya ve Fırgınlı'ya erişecektir .
- Bornova demiryolu , bugünkü kullanılmayan Çimentaş demiryolu bağlantısı olarak bağlanacaktır .
- 210.000 kişilik Bornova yerleşmesi , Üniversite alanlarıyla birlikte doğu da ve güney de oto yollarla , kuzeyde yamaçlarla , batı da belediye sınırları ile sınırlanacaktır .
- Çalışma alanları batı yöreleri olarak seçilmelidir .
- Sanayi yerleşmeleri çok katlı tutulacaktır . Mevcut sanayiler ise çevre sorunu olmadığı sürece bütünleştirilerek, aradaki boşluklar konut dışı kullanımlara ahenkta Sanayi binalarına ayrılabilecektir .
- Ege Üniversitesi güneyinden geçecek oto yol güzergahı boyunca 1.sınıf tarım alanlarının korunması için önlemler getirilecektir .
- Çalışma nüfus oranlarını müellif % 34 dolaylarında hesaplayacaktır .
- Toplu taşıma sistemine yakın olan alanlarda yapı yoğunluğu artışı sağlanmalıdır .

I . B . K . MAKRAFORM KARARLARI

1 - 2 Haziran 1978 tarihinde yapılan toplantıda İzmir Hava Plan Bürosu tarafından İzmir Büyükşehir Kent Bütünü'nün 1/50 000 ölçekli Fiziki Makraformu 4 alternatifin irdelenmesi ile saptanmıştır.

Bu makraform , Bornova'nın gelecekteki gelişme kararları ve planlama stratejisi bakımından , daha önce onaylanmış bulunan makraform dan oldukça farklılıklar göstermektedir .

Bu Bölgenin , bölge merkezi ve yakın çevresinin Metropoli olan İzmir Büyükşehir Kent Bütünü için önerilen Metropolitan Yönetici Merkezin (C.B.D.) Bornova Belediye sınırlarının bir kısmını kapsaması , körfeşi sarması ve bir oto yol mevcudatı ekstrems yol "LOOP " ile çevrilmesi çok olumludur . Bu " LOOP " ın Çamdibi'nden geçerek Gaziosmanlı'ya ve Güneye bağlanması çok olumlu olmakla beraber İzmir güney yerleşmeleri ile Metropolitan merkez (C.B.D.) bağlantısının ana arteri fonksiyonlarını alacak bu ekspres yol'a ağır trafikte yüklense (Bu güzergahta başka hiçbir bağlantı olasılığı olmadığından) çok sakıncalıdır . Bu yola OTO YOL fonksiyonu verilmemelidir. Bu yüzden bölgenin güneyindeki tüm yerleşmelerin (Aydın , Denizli , Buğla) Metropolitan Merkezi (C.B.D.) İzmir Büyükşehir Kent Bütünü güney yerleşmelerini ortasından kesmeden bir otoyol bağlantısının düşünülmesi ve önerilmesi zorunludur .

ANKARA - İZMİR Otoyoluna İÇİKKENT - ÇUKUR OVASI oto yol bağlantısı - nin yapılması İZMİR'İN BURSA , MANİSA - AYDIN , DENİZLİ , ANTALYA , Otoyol ağına Bornova'nın doğusundan geçirilmesi gerekli ve zorunlu görülmektedir .

BORNOVA PLANLANA KARARLARI :

Bornova 210.000 nüfus ve Makroform Plan kararları ışığında planlanacaktır.

- Otoyolun batısı İzmir (BKE) Metropolitan merkezi (OEB) olarak planlanacak ve çalışma alanları Üniversiteye kadar (OEB) fonksiyonlarını temamlar nitelikte geliştirilecektir .
- Bornova'nın gelişmesi tepsi taşınmazdan da yararlanmak amacıyla batıya doğru olacaktır .
- Atatürk Mahallesi en yoğun , daha ziyade orta gelir gurubu üstündeki sillelerin oturacağı alanlar olacaktır .
- Bugünkü Belediye arazilerine de içeren Üniversite Lojmanları kuzeyinde 25.000 nüfuslu bir yerleşme düşünülecektir.
- Bornova'nın mevcut yönetsel merkezi güneyinde ve merkez içerisinde "SIT" alanlarının bulunması nedeniyle Atatürk Caddesinden (Halen alınsakta) batıya doğru geliştirilecektir .
- Bugünkü ANKAR - İZMİR yolu kentin ana arteri olacağı nedeniyle merkez buraya kadar getirilecektir .
- Bu merkez civarından alt - üst geçit ile Bornova girişi sağlanacaktır . Üst geçit yolunun Bornova - Altındağ ve Bornova - Bayraklı - Kargıyaka bağlantısında ana arter fonksiyonlarını yüklenilebilir araştırılacak ve etüd edilecektir.
- Alt - üst geçit güneyindeki çalışma alanları ile kuzeydeki yerleşme alanlarının ilişkisinde ana arteri kesmeden sağlanabilecektir .

PLANLANA ESASLARI :

Konut Üniteleri , Nüfus yoğunluğu brüt 300 ki/ha. dir .

Bu yoğunluk değeri ve kuzeydeki yerleşmelerde azaltılacaktır.

Ortalama KAKS = 1 alınacaktır .

Atatürk Mahallesi KAKS = 0 dir.

Konut birimleri ortalamalara brüt 100 m² dir. (Atatürk Mahallesi brüt 125 m².)

Sit alanı kuzeyinde bulunan (Ersene ve Ergene) konut dokusu sabbileştirme ve uygulamaya dâhil biçimde genelde korunacaktır .

- Atatürk Mahallesi ifranları aynı muhafaza edilecek yoğunluk oranları plan kararlarına uygun uygulama yapılacaktır . Herhangi yapı adasında kooperatifleşme olduğunda da yapı toplu inşaat alanı aynı kalsın koşulu ile yükselebilir mümkün olacaktır . (Ancak tüm yapı adası için)

MEKANSAL PROJESİYONLAR
(Sonuçlara)

-	ARAZİ KULLANMA :			
	• Toplam Konut Alanı			
	• Mevcut Konut Alanlara	130.11	hektar	
	• Atatürk Mahallesi Alanlara (ilave)	250.06	"	
	• Kazımîrîk + Erşene Alanlara (ilave)	257.30	"	
		<hr/>		
	TOPLAM	637.47	"	% 33.48
-	EKONOMİK YAPI SEKTÖRLERİ KULLANIS ALANLARI :			
	• Ticaret	35.70	hektar	
	• Sanayi	52.00	"	% 7.88
	• Resmî Kuruluşlar	44.80	"	
-	SOSYAL DONATIM KULLANIS ALANLARI :			
	• İLEKOKULLAR	18.90	hektar	
	• ORTAOKULLAR	15.96	"	
	• LİSELER	3.93	"	
	• KİMLİKİ ÜCRETİM	6.30	"	
	• DGE ÜNİVERSİTESİ	291.25	"	
	• KÜLTÜR ve SOSYAL TESİLER	10.50	"	
	• DİNİ TESİLER	2.10	"	% 18.44
	• SAĞLIK	2.31	"	
-	YEŞİL ALANLAR :			
	• ÇOCUK BAĞIHLARI (0 - 6 yaş)	2.62	hektar	
	• OYUN ALANLARI (6 - 18yaş)	5.73	"	
	• PARKLAR ve YEŞİL ALANLAR	147.00	"	% 10.04
	• SPOR ALANLARI	35.70	"	
-	ULAŞIM ALANLARI :			
	• KENTSEL ANA YOLLAR	38.00	hektar	
	• KENT YOLLARI	525.00	"	% 30.16
	• DEMİR YOLU	11.00	"	

SEKTÖRLERE GÖRE ARAZİ KULLANIŞI , KİŞİ BAŞINA ARAZİ
KULLANIŞI , BİNA TOPLAM ALANLARI ve TÜM ALANLARA ORANLARI

K.A.K.S. ler

Arazi Kullanım	Alanı(ha)	m ² /ki	Bina toplam alanları m ²	Tüm alanın oranı %	KAKE
Mevcut konut	130.11	29.60	968.696	6.83	0.74
Geçmiş konut	507.36	30.55	4.147.290	25.65	0.82
Toplam Konut	637.47	30.36	5.115.986	33.48	0.80
Ticaret	35.70	1.70	249.900	1.88	0.70
İlköğretim	18.90	0.90	37.800	0.99	0.20
Orta Öğretim	15.96	0.76	31.920	0.84	0.20
L i s e	3.93	0.19	7.860	0.21	0.20
Mesleki Öğretim	6.30	0.30	12.600	0.33	0.20
Yüksek Öğretim	291.25	13.86	-	15.30	-
Sanayi	52	2.47	278.790	2.73	0.54
Küçük sanatlar	17.40	0.63	139.200	0.92	0.80
Belediye Kuruluşları	44.80	2.13	179.200	2.35	0.40
Kültür ve Sosyal	10.50	0.50	42.000	0.55	0.40
Dini tesisler	2.10	0.10	2.100	0.11	0.10
Konaklama alanları	38.00	1.81	-	2.00	-
Kent yolları	325.00	25.00	-	27.58	-
Demir yolu	11.00	0.52	-	0.58	-
Çocuk bahçeleri	2.62	0.12	-	0.14	-
Oyun alanları	5.73	0.27	-	0.30	-
Spor alanları	35.70	1.70	-	1.88	-
Park ve Yeşil alanlar	147.00	7.00	-	7.72	-
S a ğ l a k	2.31	0.11	18.480	0.12	0.8
T O P L A M	1903.67	94.19		100.00	

YÖNETİCİ MERKEZ - MERKEZLERİN KADINLAŞTIRILMASI

Kentsel ve Bölgesel Yönetici Merkez (İzmir Büyük Kent Bölümü'nün Merkezi)

Ege Bölgesinin Ekonomik , Sosyal , Kültürel ve Yönetim fonksiyonlarının konsantre olduğu İzmir Metropolitan Merkezi (Kentsel ve Bölgesel aktivite öneği)

Bornova , Çeşmeli , Bayraklı yollarında doğru gelişme göstermektedir .
Ve bu yerleşmelerin Sosyo - Ekonomik karakterini , dolayısıyla fiziki planlama kararlarını etkilemektedir .

Bornova ve Çeşmeli'nin İzmir Belediye hudutlarına yatan alan alanları ile Bayraklı'nın ovada bulunan kısımları , Metropolitan Merkez sınırları içinde kalabilecek fleksibiliteye sahip olmak üzere planlama zorundadır .

Bornova'nın belediye hudutları içinde olup , Otoyolun batısında kalan kısmı İzmir Yönetici Merkezine katılmak üzere planlanmıştır . Metropolitan merkezde olması gereken ana Karayolları da düzenlenmiştir .

KENTSEL YÖNETİCİ MERKEZ :

Bornova'da mevcut merkezin çevresinde 210.000 nüfuslu bir kent için gereken gelişme alanı yoktur . Merkezin bir kısmı da silt alanıdır .

Şehirdaki silt alanı kendi özel koşulları ile merkezin yenilenmesine katılacaktır .

Kentin gelişme yönü olan Batı yönünde , kısmen boş , kısmen planlama öneminde fonksiyon değiştirerek yönetici merkeze dönüşebilecek en uygun alan araştırılmıştır . 210.000 nüfuslu bir kentin Yönetici Merkez elemanları için (Yönetim Merkezi , Ticari Merkezler , Kültürel ve Sosyal Yapılar ve geçeleri de bu bölgenin canlılığını devam ettirebilmesi için bir miktar konut) önerilen yeni merkezle , mevcut merkez arasında yoğun bir konut alanı bulunmaktadır .

Bornova'da yönetici merkez 20.32 Ha. alan kaplanmaktadır , önerilen yeni yönetici merkez için 852.600 Ha. lık alan gerekmektedir .

Bayraklı (Atatürk Caddesi) caddesi ile , Makroformundaki İzmir - Bornova girişinin çekişliliği , İş ve Ticaret Bölgesini (C.B.O.) kentsel ana artere ulaştıracaktır .

YÖNETİCİ MERKEZDE KULLANILAN ALANLARI

	Mevcut durum parsel alanı (m ²)	%	Projeksiyon parsel alanı(m ²)	%
K o n u t	50.	26.66	285.261	33.50
Ticaret(K.Sanatlar)	125.715	6.19	78.500	9.21
Servisler	14.592	7.10	68.500	8.03
Eğitim	9.810	4.83	19.500	2.29
Dini kurumlar + Barnaklar	5577.5	4.74	9.560	1.12
Kültür- Eğlence	2532.7	1.25	14.500	1.70
Park + Spor	41140	20.24	128.700	15.10
Ulaşım	41970	20.64	169.279	19.85
Yaya yolları ve meydanlar	16817.5	8.27	78.440	9.20
T O P L A M	203208.2	100	852.600	100

SANAYİ . .

Bornova'da Sanayi Bölgesi olarak tanımlanan alanın yarısına yakın bir kısım Bölgesel Yönetim alanlarına olarak faaliyet göstermektedir .
(DSI ve Karayolları Bölge Müdürlükleri , TSK Bölge Müdürlüğü , Orda ve Tarım Bakanlığa Bölge Müdürlüğü , Veteriner Müdürlüğü , Zeytinlik Enstitüsü, SGA Siteleri Müdürlüğü) geniş alanlar kaplamaktadır .

Sanayi Bölgesinde , büyük den Zeytinyağına , Demir dökümün Boya Sanayine , Orda ile tehlikeli kokulu , dumanlı ağır sanayi birimlerine kadar çeşitli sanayi türleri tam bir karışıklık içindedir . Ayrıca , inşaatlara tanınlanmakta olan ve kısım kısım faaliyete geçen Küçük Sanayi Siteleri ile AŞGÇ İşleri Küçük Sanayi Sitesi de inşaat halindedir .

İlk değerlendirme merkezlerinde bulunması gereken tarım Ürünlerinden Mercimek , Pamuk , ve Yağ Fabrikaları da bulunmaktadır .

İzmir Metropolitan bir merkez olacağından hizmetler sektörü ağır basacak ve sanayi yerleşmeleri genellikle uydu kentlerde , İzmir'in çevresinde toplanacak ve sanayide gelişmelerin yöresel hizmetlerde gelişmeler lehine dönüşüm gösterecektir .

Bornova sanayi yerleşmeleri yönünden , İzmir'in kentel ve bölgesel aktivite merkezine fazla yakındır .

Bornova bir sanayi yerleşmesi olmalıdır . Nevruz karışık sanayi bölgesi yine gelişen alanı olarak , sunanla Metropolitan merkez fonksiyonlarına dönüşebilecek üzere , konut dışı kentel kullanma alanlarına olarak planlanmıştır. Oadaki iki Çimento Fabrikasının da kaldırılması gereklidir .

Bornova da Sanayiciler arasında , Kemalpaşa'da yerleşme eğilimi mevcuttur .

APPENDIX 11: 1/100.000 Scaled İzmir Metropolitan Environmental Plan Legend

