

Environmental Security and Reflections on Turkey

Nesrin Kenar* & Özlem Baştan**

Abstract

Since the late 1980s, there has been considerable concern in academia and internationally regarding global environmental change and its impact on security. Many environmental problems such as environmental pollution, resource shortages, global warming, climate change, and environmental migrations make themselves felt from local to the global level, and the concept of environmental security has emerged. Because environmental degradation affects social, political, and economic life and adversely affects living life, and security threats are arising from environmental changes seen as more complex and uncertain than traditional threats. Therefore, environmental problems have been included in the security concept as a threat to countries after the Cold War. The environmental problems that form the basis of the environmental security approach and their impacts occur differently in each country. This study aims to approach in the context of environmental security and environmental security threats, assess the environmental risks faced by Turkey, and study the instability in the country that is likely to encounter as a source of Turkey's environmental problems. Firstly, the study will examine the environmental security approach and the potential of environmental problems to cause instability and conflict. Later, Turkey's environmental problems and environmental safety risks will be evaluated in the environmental

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security approach. Turkey's environmental policy will also be touched on in this study.

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1. Introduction

One of the primary purposes of all living creatures is to be protected and to survive. The main reasons that push people to live collectively are the need for protection and the need to provide their own security. In this context, security is one of the most basic needs of all living things. This security concern also applies to states. States also want to secure and continue their existence.

The concept of security is handled together with the concepts of danger, risk and threat. In cases where danger, threat and risks are eliminated, a safe environment is provided. One of the important issues regarding the concept of security is the questions about the reference point of security such as whose security, what security. While security threats have changed over time, the reference point has also changed. While the most important reference point in traditional security understanding is the security of the state, the means of ensuring security are military and political methods. While military and political issues were the primary priority, issues such as environment, individual, health and food were of secondary importance. On the other hand, the concept of security has been redefined and expanded and transformed due to the inadequacy of traditional security understanding in combating new threats. One of the new areas of security is environmental security. The increasing environmental problems, whose negative effects were noticed in the early 1970s, and its borderless nature, revealed the concept of environmental security. The concept of environmental security is the concept that best defines the relationship between environment and security in the context of environmental problems and the social problems that this situation causes. Within the concept of environmental security; It contains threats such as economic and political instability caused by environmental problems, individual and food security, disagreements and conflicts between countries and between different groups within the borders of a country due to the distribution of environmental resources.

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The basic idea on which environmental security is based is that environmental problems pose a threat to the existence, security and continuity of nations. These threatening environmental problems are environmental pollution called water, air and soil pollution, thinning of the bard layer, climate change, drought, water scarcity and natural disasters and the instabilities caused by these problems.

Today's environmental problems and environmental security threats arising from these problems affect all countries, albeit at different levels. In Turkey, population growth, industrialization, rapid and unplanned urbanization are creating environmental pressures. These pressures are transforming into a series of environmental challenges, such as environmental pollution, climate change and the associated desertification and water scarcity. It is expected that Turkey will feel impact of these problems in the coming years in many areas such as social economic and cultural.

The purpose of this study is to assess the environmental risks faced by Turkey in the context of environmental security approach and environmental security threats, and to investigate the instability in the country Turkey is likely to encounter as a source of environmental problems. Firstly, the study will examine the environmental security approach and the potential of environmental problems to cause instability and conflict. Secondly, Turkey's environmental problems and environmental security risks will be evaluated in the context of environmental security approach. Turkey's environmental policy will also be touched on in this study.

2. A New Security Approach: Environmental Security

Environmental security; It can defined as a security approach that emerges from environmental problems and environmental degradation in the process of humanity's transition to settled life and subsequent industrialization. Jon Barnett explained the concept of environmental security based on the "environmental insecurity" situation and

environmental insecurity has been defined as a state of insecurity consist of environmental pollution, environmental degradation, environmental destruction, climate change, resource scarcity, poorly managed resources, poverty, conflict, environmental refugees and military security issues. (Barnett, 2007, p.4-5). This insecurity situation made it clear that the environment is a security problem. In this case, in order to establish a relationship between the environment and security, it is necessary to have factors such as the adverse effects of living and non-living things due to environmental problems, instability in the economy, health, social and political areas within the country, conflicts between states or conflicts within the borders of the state and environmental migration.

Until the end of Cold War period, environmental problems could not be the subject of international relations theories examining conflict and security problems between states(Smith,1993,p.28-45). Since the 1950s and 1960s were the years of methodological discussions between realism and idealism in the discipline of international relations and realism gained absolute superiority, in this period, traditional security studies focused on the security of the state, inter-state armed conflicts, the fight against threats to the security of the state from outside its borders and the balance of power policies(Lee, 2002, p.77).

However, in the 1970s and 1980s, with the effect of the detante environment that emerged in the international system, criticisms began to emerge against traditional international relations theories and security understanding. With the end of the Cold War and the disappearance of traditional security threats, the emergence of new security threats and the increasing visibility of the negative effects of environmental degradation and growing concerns about environmental problems have intensified the search for a more comprehensive concept of security in the political, academic and military fields (Graeger,1996, p.109). The concept of security, which is one of the main elements of international relations and differs according to time, place and the

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conditions of the period, has changed over time with the changing conditions and developing technology, and has expanded and transformed by incorporating new threats (Lee, 2002, p.77). In this context, environmental security has emerged as a new security area.

Environmental degradation and the consequences of this degradation constitute the basis of the connection between the environment and safety. The connection between the environment and security and the emergence of the environmental security approach is the result of the environmental problems attracting the attention of the international community. As a result of factors such as rapid population growth, the struggle of humans to dominate the nature, the increase in resource consumption in order to meet the increasing needs, environmental problems have started to attract attention, especially since the 1960s. Since the 1960s, environmentalist movements have emerged in developed countries against environmental problems, and this has led to the politicization of the environmental problem in the international era.(Ertürk, 1998, p.171; Keles&Hamamcı, 2005). In this period, some important works have been published to draw attention to the effects of increasing population and overconsumption on environmental degradation."Silent Spring" published by Rachel Carson's in 1962 (Carson, 2004), Paul R. Ehrlich's "Population Bomb (1968)" and the Roman Club's "Limits to Growth Report (1972)" (Meadows, Meadows, Randers, & BehrensIII, 1972) demonstrated that environmental problems and environmental degradation could pose a threat to the existence of the entire planet, and managed to attract the attention of the public. Besides, Garnett Hardin's work titled "Tragedy of the Commons" is also important in establishing a connection between environment and security. Hardin argued in his study that human beings depend on property and as a result, excessive and unconscious use of assets such as air, water, soil, plants, roads and environment, which should be used in common, has bad consequences for humanity(Hardin, 1968, p. 1243-1248). The turning point in defining the relationship between environment and security was Richard Falk's work "This

Endangered Planet" in 1971, in which he described the relationship between resource scarcity and violence. Falk expresses the state of mobilization of those who have a larger share of resources against those who have a smaller share in order to defend their resources (Falk, 1972).

Since the 1970s, the relationship between the environment and security has attracted the attention of academics, but has also started to be addressed as a security problem in the international arena. In this context, Lester Brown, in her work titled "Redefining National Security", argued that besides existing national security issues, new threats such as climate change emerged and that a link could be established between environmental problems and security. Richard Ullman also stated in his work "Redefining Security" that the understanding of national security should be expanded (Ullman, 1983, p.133). The most important document that draws attention to the relationship between environment and security in the international arena is the "*Our Common Future*" report published by the United Nations Environment and Development Commission in 1987. This report highlights the links between the environment and security and argues that environmental degradation can cause instability and therefore, should be included in the issue of safety. Since the mid-20th century, the increasing population has led to the destruction of more natural areas to meet this population's needs (Tolunay, 2017, p.153). Increasing and diverse environmental problems with the driving force of population growth, industrialization, technological developments, and globalization have brought various concerns such as the destruction of natural resources, bringing along the searches for identifying these problems and formulating solutions and strategies (Kaypak, 2013, p.18-20). In 1991, the definition of security expanded in the NATO Strategic concept, and environmental problems defined as security threats.

Studies trying to establish a relationship between environmental problems and conflict have become widespread in the post-Cold War

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period. This has been explored by research groups such as Thomas Homer-Dixon and the Toronto Group, the Swiss Environment and Conflict Program (ENCOP) and the Oslo International Peace Research Institute (PRIO). These studies acknowledge that environmental degradation can lead to poverty and, conflict in many cases. According to Homer-Dixon, environmental problems do not cause conflict. However, if there is a potential for internal conflict or inter-state conflict or conflict in developing countries for another reason, environmental problems have an accelerating effect on this conflict. Tensions within a country's boundaries or interstate can increase with environmental resource shortages, and this increase can drive already existing tension into a conflict (Homer-Dixon, 1994,p.6). Toronto Group, ENCOP and PRIO research emphasize that resource scarcity and environmental degradation increase conflict and violence in all areas, social, political, economic, religious and ethnic. Similar to these studies, Myers emphasizes that with the depletion of a nation's environmental resources, the country's economy will decline steadily, the social fabric of the country will deteriorate and its political structure will become unstable, and indicates that as a result of these developments, a conflict in the form of turmoil and uprising or a conflict with other countries may arise in the form of tension and hostility (Myers, 1986, p.251). In summary, it increasingly recognized that environmental problems play an important role in increasing human vulnerability, degrading livelihoods and human well-being, creating instability, and potentially creating or exacerbating violent conflict(Renner, 2004, p.314).

Based on this information, when we touch on the threat and risk areas of environmental security; Threats caused by environmental pollution can be said as the first risk area. Environmental degradation such as air, soil and water pollution, soil erosion, deforestation can adversely affect living conditions, cause conflict between affected parties and pose a security risk(Graeger, 1996, p.109). The second risk area is that environmental problems threaten political and economic stability. For

example, countries are affected economically as a result of environmental problems such as global warming and climate change changing the air balance of the world and causing natural disasters. If the economy is bad, the political life of the countries can be affected negatively and cause political instability (Barnett, 2003, s. 8-11). In addition, environmental problems negatively affect food safety (Ericksen, S.I.Ingram & M.Liverman, 2009, p.373-375).

The third risk area is the potential for problems arising from the allocation of environmental resources to cause conflicts between countries and between different groups within a country (Keleş & Ertan, 2002, p.240-241). Historically, there have been disputes and conflicts over non-renewable resources such as oil and renewable resources such as water. There have been disagreements between Turkey-Iraq-Syria about sharing the Tigris and Euphrates rivers (Freeman, 2001, p. 127-140).

The fourth risk area is mass migration movements caused by environmental problems. Environmental refugees are people who feel compelled to leave their homeland due to the depletion of their livelihoods due to environmental degradation. It is estimated that the number of environmental refugees will increase due to environmental problems (Myers, 1986, p.253) and, by 2050, 200 million people will be displaced due to climate (CNNTürk, 2017).

Generally speaking, the concept of environmental safety can be explained in three dimensions. The first dimension is the environmental crisis dimension that will threaten the lives and existence of human species and other living creatures. The second dimension is that environmental problems threaten political life and economic stability. The third dimension is the division of environmental resources and the problems caused by the environment causing conflicts between countries and communities within the country (Keleş & Ertan, 2002, p.240-241).

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Most environmental security problems are not confined to a specific region because the functioning of the environment is mostly related to the global ecosystem. In other words, an environmental security problem arising in a country or region is not limited to the country concerned but can affect all countries. Therefore, environmental issues or cross-border concerns that do not exceed a specific regional boundary must be addressed at the regional and / or global level (Lee, 2002, p. 80). In addition, developing countries and poor countries are more vulnerable to environmental changes (Renner, 2004, p.314). On the other hand, the needs and priorities of each country differ.

A resource and environmental problem, which is not so crucial for a country or a region, may be vital for another region. In this context, the environmental problem, which is a primary priority for a country, may not be seen as necessary by the other country(s). Based on this assessment, it is crucial to identify priority environmental issues and the environmental threats faced by Turkey, to combat the risks of environmental security effectively

3. Assessment of Turkey's Environmental Issues in the Context Environmental Security

Since the geography of a country is one of the national power elements of that country, it is one of the elements that determine the security priorities and the general framework of its domestic and foreign policy. Turkey has territory located in Asia and Europe, and is a home to many different cultures and civilizations. Like all countries, there are advantages and disadvantages of Turkey's geography. Turkey located in a geographic location close to competition and conflict area of the great powers throughout history. Therefore, security priorities have always been political and military issues. However, the environmental degradation of the global environment due to the increasingly common problems for Turkey as well as all over the world began to create attention and threats. Therefore, in this part of the the study the

environmental problems and environmental security risks of Turkey will be evaluated in the context of environmental security approach.

3.1. The Impact of Population Growth on Environmental Security

Environment is directly affected by population growth (Myers, 1987, p.15). The main issue in the relationship between the environment and the population is the deterioration of the increasing population and the limited resources. Turkey's annual population growth rate tends to decrease, but Turkey's population is constantly growing. According to Turkey Statistical Institute (TUIK) data, Turkey's population is 83,614,362 as of 2020. Turkey's population growth rate was 13.9 per thousand in 2019, it decreased to 5.5 per thousand in 2020. (TÜİK, 2020). According to statistical data by TUIK, it expected that Turkey's population to reach 86,907,307 persons in 2023 and reach 100 331 233 persons by 2040 (TUIK, 2018). It estimated that this increase will increase the country's need for non-renewable resources such as oil and renewable resources such as water and food, leading to the depletion of natural resources.

Another critical effect of the population on the environmental security is that it causes rapid and unplanned urbanization. According to data of 2020 by TÜİK, 93% of Turkey's population already lives in cities (TÜİK, 2020).

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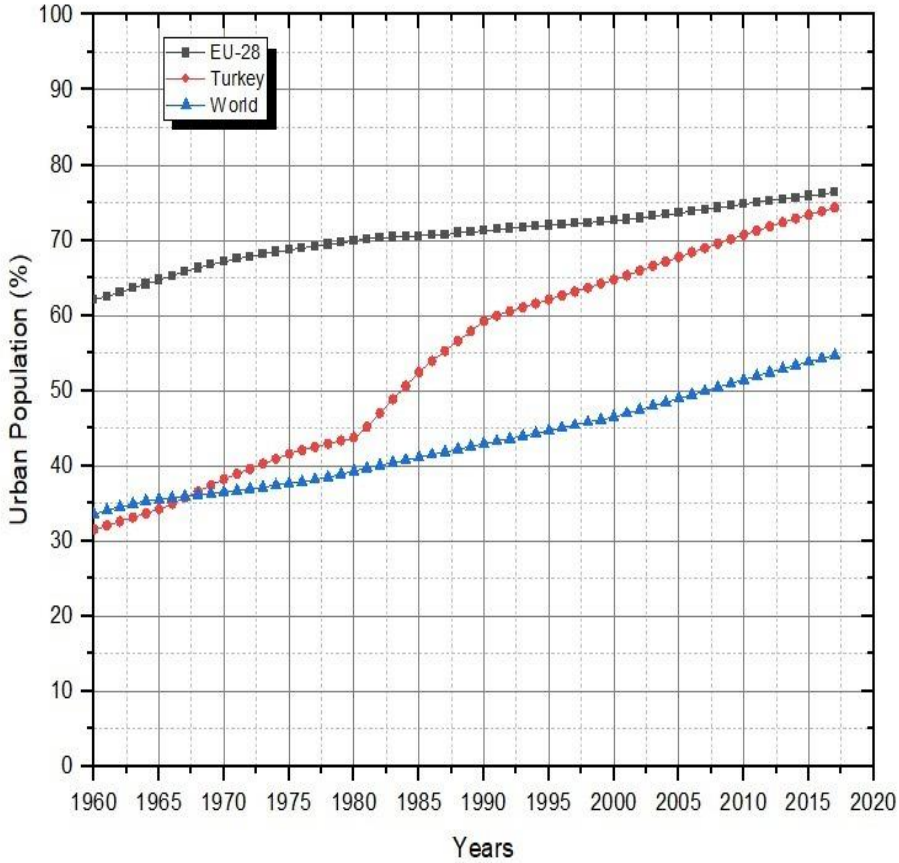


Figure 1. The World and Urban Population Ratio in Turkey in Annual Basis (%) (Source: <https://cevreselgostergeler.csb.gov.tr/kentsel---kirsal-nufus-orani-i-85670>)

Population growth causes practices that directly harm nature, such as opening new agricultural land and settlement areas, unplanned urbanization, unconscious and excessive grazing of animals and mining, and at the same time, in order to meet the increasing energy and food needs, many indirect effects such as fossil fuel use, excessive fertilizer, and pesticide applications, pollution arising from industrial activities, global warming, and climate change, deforestation, erosion, air, water, soil pollution that affect human welfare and security causes the environmental problems. The natural increase of the population of

the country and the impact of the crisis in Syria and the mass influx of refugees into Turkey, constitutes demographic pressure on the environment. For example, the number of registered Syrians under temporary protection in Turkey is 3.665.946 as of March 31, 2021 (Mülteciler Derneği, 2021).

This case refers to the use of a severe effort, money, and resources to Turkey. Turkey shelter to refugees, such as education and health assistance, is available in many areas. However, this rapid increase in the number of immigrants leads to an increase in environmental problems in these cities because they are not distributed evenly in all cities of the country, and concentrated in cities close to the border. (Arslan, Bozgeyik, & Alancıoğlu, 2016, p.137).

As a result of all these, various environmental problems arise from human activities such as environmental pollution, global warming, and climate change. If all these problems not managed well, they will lead to dangers in essential areas of life such as individual, health, food, and economy.

3.2. Water Pollution

According to the Environmental Assessment Report published by the Ministry of the Environment and Urban Planning in 2019, one of Turkey's most important environmental issues is water pollution. Population growth, domestic and industrial wastes, urbanization, industrialization, and agricultural wastes are the most critical factors that cause water pollution and suppress the amount of available clean water.

According to World Bank 2017 data, 98.87's% of the population in Turkey has the opportunity to benefit from essential drinking water services. This rate is 98.61% in cities and 99.63% in rural areas. The world average on this issue is 89.6%. (Worl Bank, 2021). Although Turkey's territory surrounded by water on three sides and there are many rivers, lakes, and reservoirs in Turkey, due to Turkey is located

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in geographically semi-arid regions of the world, according to the Falkenmark indicators, Turkey defined as a "water stress" country (Hakyemez, 2019). On the other hand, Turkey's underground and aboveground water sources are not of good quality. For example, according to the Environmental Problems and Priorities Report published by the Ministry of Environment and Urbanization, quality classes for a total of 143 surface water have been determined. According to the report, 34 of Turkey's aboveground water sources in high-quality water (1st Class), 26 of them in less polluted water (2. class), 33 of them contaminated water (3rd year), 50 of them in heavily polluted water (4th) group (T.C. evre ve Őehircilik Bakanlıđı, 2020, p.2).

According to the results derived from the data obtained from the 81 cities of Turkey in 2017, water pollution was determined to be the priority environmental problem in 27 cities. According to the drinking water data of 2016 published by TUIK, only 57.4% of the drinking water distributed can be treated. While this situation causes health problems arising from water pollution, it also causes damage to agricultural activities and biological diversity. For example, in 2014, in the Hisarcık district of Kütahya, the District Sanitation Board banned water use in 13 villages due to the mixing of arsenic into drinking water due to the boron mine (CNN Türk, 2018). It means that the creatures living in polluted waters, irrigated agricultural lands, and people who benefit from water are also adversely affected by water pollution.

If need to assess the water pollution in some basins in Turkey;

When water pollution, which is the priority problem in 27 provinces according to 2017 data, evaluated on a basin basis; It has determined that basins where water pollution is the priority problem concentrated in Meri-Ergene, Büyük Menderes-West Mediterranean, Susurluk-Gediz, Kızılırmak-Yeşilirmak, Eastern Black Sea-oruh, Lake Van and Asi River Basins(Nuray, Manap, Sarıođlu, Sanalan, & Aydın, 2020,

p.2). In the Meriç-Ergene basin, the Meriç River polluted by wastewater from Bulgaria's iron and steel industry. Also, the amount of wastes and phosphate and nitrogen resulting from the use of chemical and natural fertilizers in the agricultural areas in the Meriç-Ergene basin is high. Industrial wastes, agricultural and domestic wastes reach Meriç and Ergene Rivers and cause pollution (Akın & Akın, 2007, p.114-115). The Susurluk-Gediz basin also carries similar risks. It stated that if the pollution in the Gediz River continues for 10-15 years, it will become harmful even for agricultural irrigation(Körbalta, 2019, p.70). However, Büyük Menderes and Küçük Menderes rivers basins are at the III and IV. class pollution level. Asi River basin exposed to excessive pollution, especially due to agricultural wastes, fertilizer wastes, and industrial activities. Pollution in the Asi River basin has reached the III. and IV. grade levels. In the Kızılırmak River in the Kızılırmak Basin, there is III. and IV. degree of pollution in regions where industrial facilities located. In the Yeşilirmak Basin located in the Central Black Sea Region IV. class-level contamination situations exist due to food industry wastes and domestic wastes (T.C.Çevre ve Şehircilik Bakanlığı, 2020).

Since water has vital importance in living life, pollution and deterioration of water damage biological diversity on the one hand, and negative reflections on economic, social, and even political spheres on the other hand. Water pollution and inadequate treatment systems lead to the transmission of cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio. For example, it estimated that around 828,651 people die each year from diarrhea due to unsafe drinking water, sanitation, and hand hygiene worldwide. (UN Water, 2020, p.71). Water is essential for socio-economic development and the continuity of the ecosystem. Water problems may arise among the states that share freshwater resources as the existing freshwater resources cannot meet the needs and become polluted. Water is being a strategic resource, and its necessity for a strong economy can lead to conflicts for water(Yıldız Y. G., 2004, p. 263).

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Turkey has 25 river basins, and 6 of them are transboundary water. One of them is the Meriç river. Meriç River is born from Bulgaria and constitutes the border between Turkey and Greece, and The Meriç river flows into the Aegean Sea. Asi river is born in Lebanon and passes through Syria and Turkey, and flows into the Mediterranean. Çoruh river is born in Turkey and flows into the Black Sea from Georgia. Aras River is born in Turkey, passing through Armenia, Iran, and Azerbaijan, and flows into the Caspian Sea. Euphrates River, born in Turkey, passes through Syria and Iraq, coupled with the Tigris river in Iraq, and flows into the Persian Gulf. Tigris river is born in Turkey, combined with the Tigris in Iraq, and flows into the Persian Gulf. There has been no dispute between the basin countries regarding the water sharing of the Meriç, Çoruh, and Aras rivers.

However, Turkey, Iraq and Syria experienced the problems in 1957-58 and 1998, and have come to the brink of war due to dams, irrigation projects to increase the agricultural production and hydropower plants (Çelik, Bilbay, & Aksungur, 2019). Fortunately, there has not been a war between Turkey and Iraq and Syria.

While there are no problems between the basin countries of the Meriç, Aras and Çoruh rivers due to water sharing; there are several reasons underlying of conflict between Turkey and Syria on the sharing of the waters of the Orontes River and Euphrates River, and of conflict between Turkey and Iraq on the sharing of the waters of the Tigris River and Euphrates River. The first reason is the insufficiency of water resources and the availability of absolute water scarcity in Iraq and Syria. The second reason is the existence of problems in relations between Turkey and Iraq and Syria besides water sharing. However, with the improvement of political relations between Turkey, Iraq and Syria water sharing issue of the Euphrates, Tigris and Asi rivers dropped from the agenda and did not lead to an armed war among Turkey, Iraq and Syria.

3.3. Air Pollution

Air pollution is important in terms of having negative effects on the climate and human health. Air pollution is a major environmental risk to health and causes lung diseases, cancer, stroke and respiratory diseases (OECD, 2019). Air pollution has been identified first priority problem in 27 provinces, second priority problem in 24 provinces, and third primary problem in 20 provinces out of 81, air pollution has been identified as a significant environmental problem in 71 provinces in total (T.C.Çevre ve Şehircilik Bakanlığı, 2020, p.15). The causes of air pollution in Turkey are household heating, vehicle use, mining enterprises and thermal power plants, iron and steel industry, urbanization, fertilizer industry, cement industry, petrochemical industry and energy production (Sümer, 2014, p.41-43).

Based on data obtained from the measurements made in order to determine the air quality in Turkey, it was found that the air which is inspired Turkey contains particles harmful to the health of people. The proportion of PM10 and PM2.5 particles in the air in Turkey was determined to be significantly above standards limit values set by European Union (EU) and the World Health Organization (WHO). According to European Environment Agency (EEA) data, 97.2 percent of the urban population in Turkey is exposed in unhealthy levels of particulate matter (PM10). According to the data of PM10 in 2018, Turkey's most polluted air in the provinces of Ankara, Istanbul, Izmir, Bursa, Adana, Erzurum and Manisa, Ağrı, Iğdır, Mersin and Kahramanmaraş. It was determined that the limit value was exceeded in all stations in Istanbul, Ankara, Zonguldak, Çorum, Amasya, Sivas, Erzincan, Erzurum, Edirne, Sakarya, Bursa where PM2.5 measurements were made (TMMOB Çevre Mühendisleri Odası, 2018, p.15-19).

According to the 2018 World Health Statistics Report of the World Health Organization; Turkey's mortality rate is 47 in hundred thousand people in indoor and outdoor air pollution-related deaths, Turkey ranks

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22 among the 53 European countries (World Health Organization, 2018). According to OECD data the number of deaths from diseases related to air pollution in Turkey in 2019 is about 30 thousand.(OECD, 2019). Air pollution also poses an important environmental security threat as it causes an increase in the amount of carbon dioxide in the atmosphere and causes global warming, which is called the greenhouse effect. The effects of global warming are not limited to countries and pose a threat to all humanity.

3.4. Climate Change

Climate change, especially towards the end of the 20th century, is defined as the occurrence of changes in the global and regional climate as a result of the increase in the level of carbon dioxide resulting from the use of fossil fuels (Oxford Dictionary,2019).Turkey is located in one of the world's most vulnerable regions to climate change in the Mediterranean Basin. Therefore, a temperature increase in the Mediterranean Basin has the potential to cause many negative consequences such as unexpected weather events, drought, and an increase in the number of forest fires. In addition to these, there are also impacts such as loss of biological diversity, loss of agricultural productivity and decrease in tourism revenues.

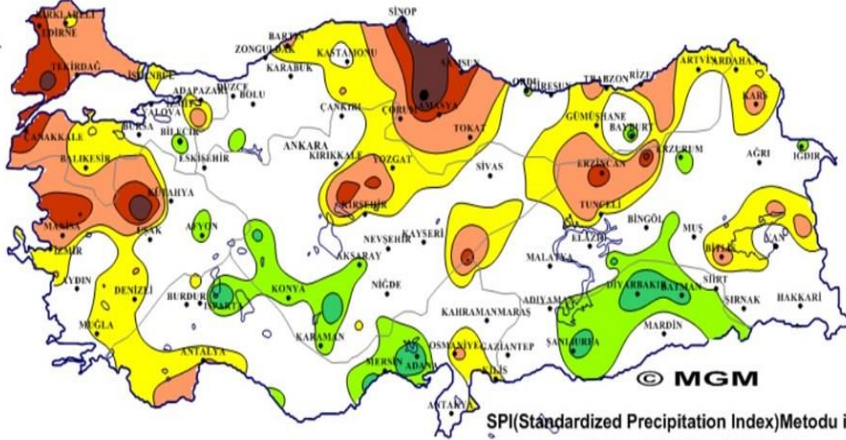
One of the most critical factors causing climate change is greenhouse gas. Because Turkey uses fossil fuels, primarily coal due to meet its own energy needs, and the increase in Turkey's energy consumption is rapidly increasing with the population growth and rapid industrialization. Therefore, Turkey's greenhouse gas emissions increases in years, and has made increased more than most of the OECD countries in the last 10 years(OECD, 2019, p.20).

The primary sources of greenhouse gas emissions in Turkey; emissions resulting from the use of energy resources-71,6%, industrial activities-12,5%, agricultural activities- 12,5% and wastes 3,4% (T.C. Çevre ve Şehircilik Bakanlığı, 2018).

When we examine the example of the indicators of climate change in Turkey, such as drought, extreme weather events, increasing instability in precipitation, and increasing natural disasters in Turkey, temperature values in Turkey are drawing an increasing graph. For example, the average temperature of 1981-2010 was above 13.5 °C. For example, the average temperature values were above 13.5 °C between 1981-2010. According to projections made by the General Directorate of Meteorology, it expected that the average annual mean temperature in Turkey expected to increase 1.5 - 2.6 °C in the 2016-2099 period. It estimated that the average annual temperatures will increase 1.4 °C in the first half of the century and an average of 2.2 °C in the second half (Meteoroloji Genel Müdürlüğü, 2021). In terms of precipitation, while the average annual precipitation was 574 mm in the 1981-2010 period, it increased by 1.9% in 2019 to 585.1 mm (Meteoroloji Genel Müdürlüğü, 2019, p.5-6). Irregularities in rainfall cause flooding of coastal cities and damage to agricultural lands. There are an increase of 12 cm in sea level in the Mediterranean and Black Sea regions (Bayındırlık ve İskan Bakanlığı, 2009, p.16). Figure 2 shows the map of Turkey's 12-month drought. According to Figure 2, the regions with medium and robust drought in the Eastern Black Sea, Middle Black Sea, North Aegean, and West Marmara Regions. Erzurum, Kars, Erzincan, and Van provinces in the Eastern Anatolia region, Kayseri and Kırşehir in the Central Anatolia, and Bitlis in the Southeast are among the places where drought observed.

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12 Aylık Değerlendirme



* Bu veriler kalite kontrolünden geçmemiştir.

SPI(Standardized Precipitation Index)Metodu ile

Meteorolojik Kuraklık Haritası

12 Aylık (Kasım 2019-Ekim 2020)

Hazırlanış Tarihi: Kasım 2020

Figure 2. 12-Monthly Drought Map (Source: Meteoroloji Genel Müdürlüğü, <https://mgm.gov.tr/veridegerlendirme/kuraklik-analizi.aspx>)

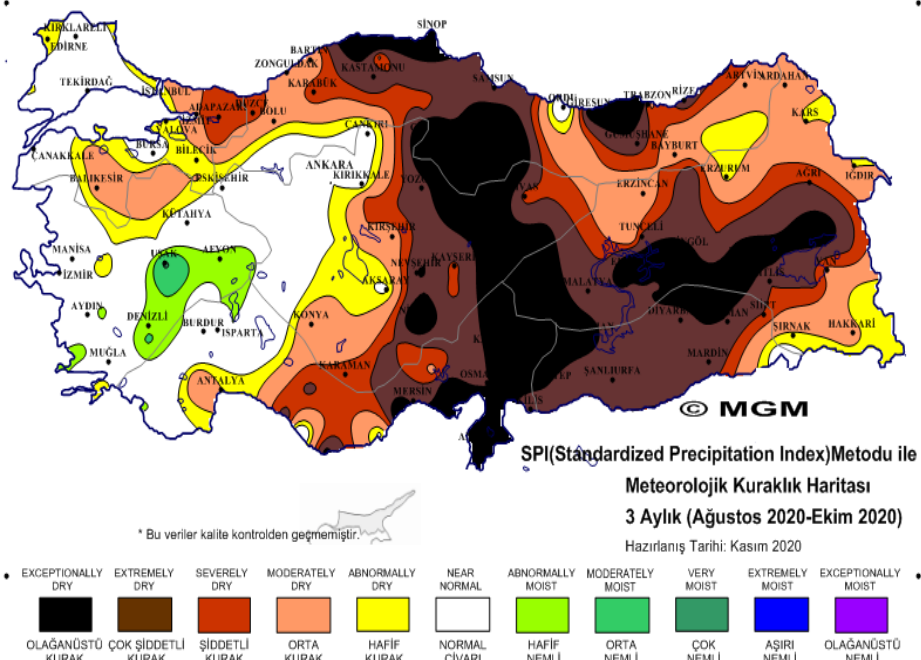


Figure 3. 3 Monthly Drought Analysis (Source: Meteoroloji Genel Müdürlüğü, <https://mgm.gov.tr/veridegerlendirme/kuraklik-analizi.aspx>)

As seen in Figure 3, it is seen in 3-month drought data that between August 2020 and October 2020, moderate, severe, very severe, and extraordinary droughts experienced in most of the country.

Climate change also puts pressure on water resources. Turkey's area of 779 500 km² and an average annual precipitation volume of 450 billion m³ and annual consumable surface and underground water potential total of 112 billion m³(T.C. Tarım Orman Bakanlığı, 2019, p.14). Turkey, a country that is not rich in water. With increasing population and increase in water usage in the parallel, Turkey is moving towards becoming a "water-poor" country. The annual amount of water available per person is around 1.519 m³. Countries with per capita water below 1000 m³ included in the category of "water-poor"

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countries. Turkey also in the category of countries facing water scarcity. According to the data derived from research, it anticipated that amount of water available per person is to be around 1.120 m³ / year in 2030 in Turkey. The occupancy rates of the dams are decreasing with the increase in temperatures and the imbalance in precipitation. For example, according to the threshold measurements made on April 18, 2021, it has been observed that dams are 80.72% complete in İstanbul, Turkey's most populous city. However, it seen that the occupancy rate of dams is 20% less than the occupancy rate on April 18, 2011 (İSKİ, 2021). The decrease in the amount of water also adversely affects access to drinking water and many sectors such as energy and agriculture.

The most frequently experienced natural disasters in Turkey are storms, floods, droughts, and forest fires. The year 2020 was a year with the most extraordinary events ever, with 984 extraordinary meteorological events; 30% of these incidents were heavy rain/flood, 27% storm, and 23% hail(Meteoroloji Genel Müdürlüğü, 2021).

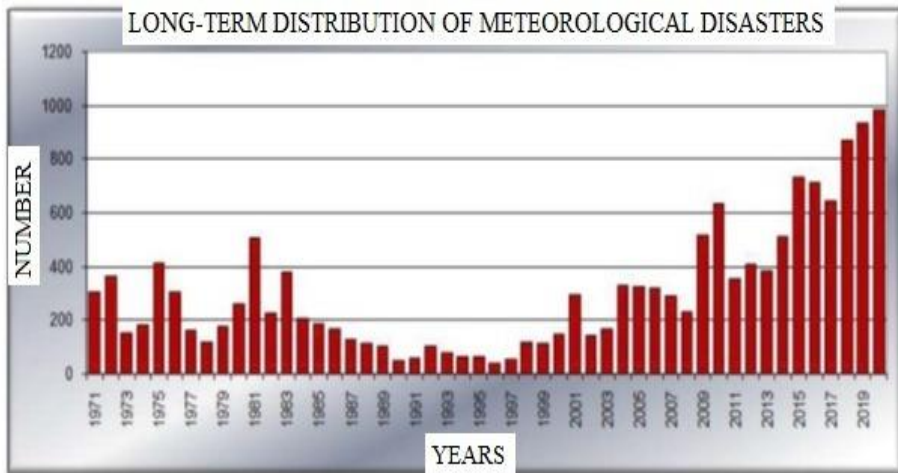


Figure 4. Annual Unusual Meteorological Event Numbers (Source: Meteoroloji Genel Müdürlüğü, Türkiye 2020 Yılı İklim Değerlendirmesi, www.mgm.gov.tr)

Natural disasters cause loss of life and property. For example, extreme rainfall events in many regions in Turkey in 2020 it has led to life and property losses. Floods and rains experienced in many cities such as Amasya, Tokat, Karabük, Sivas, Ankara, Eskişehir, Bursa, Tekirdağ, Edirne, Manisa, and Nevşehir have also negatively affected tens of thousands of hectares of agricultural land. A total of 1070 decares of agricultural land has damaged due to heavy rain and hail in Karabük. It has stated that the economic damage caused by the flood and hail in Ankara, Burdur, and Bursa is approximately 38.000.000 TL. (İklim Haber, 2020).

Another example experienced in Düzce. As a result of the flood disaster in 2019, 125 decares of vegetable gardens and 5989 decares of hazelnuts damaged in agricultural areas (İklim Haber, 2019). If we look at forest fires; in Turkey 3350 forest fire occurred in 2020 and 20.870 hectares of the forest area has been damaged (Çardaktepe, t.y.).

On the other hand, forests affected by climate change are both affected by the problem and triggering the problem. The most important effect of forest fires and deforestation is global warming and climate change. One of the most essential functions of forests is to protect soils against erosion. Erosion is increasing with the disappearance of forests. Accordingly, deterioration observed inland structures, and soils lose their productivity. Simultaneously, floods and overflows experienced, and water resources are negatively affected in terms of quantity and quality (Chakravarty, Ghosh, Suresh, Dey, & Shukla, 2012, p.15-16). The destruction of forests also negatively affects the timber and paper industry, causing economic losses. The activities of extinguishing fires and re-planting seedlings also cause an additional cost for the country's economy.

The emergence of climate change as a decrease in groundwater, drought, and imbalance in weather events also adversely affects crop productivity and poses a threat to food security. Production of corn, grain, and rice, which are primary food products, has decreased by 6%

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since the 1970s due to climate change. Turkey is among the countries that experienced a decline in agricultural production due to global climate change. Turkey is among the countries that will experience a decline in agricultural production due to global climate change. It is expected that cereal production will fall 20% by 2050 in Turkey due to the extreme temperatures and drought. (CNNTürk, 2017).

Climate change also has an impact on human health. Deaths due to extreme temperatures, increased risk of cancer due to air pollution, diseases caused by water and food, loss of life and property due to natural disasters are examples of this situation. Apart from this, there is an increase in ticks and insects mutated due to climate change. For example, according to official records, 8742 people became ill, and 409 people lost their lives in Turkey because of Crimean-Congo hemorrhagic fever between 2008 to 2017 (T.C. Çevre ve Şehircilik Bakanlığı, 2018, p.154).

3.5. Soil Pollution

Since the beginning of the twentieth century, with the transition to modern agriculture and the acceleration of industrialization, soil pollution has also started to be seen as an environmental problem. Industrialization, wars, mining, and concentration in agricultural activities are the factors that cause soil pollution (FAO, 2015, p.169).

Factors that lead to soil pollution in Turkey are household wastes, unfair agricultural practices, and pesticide use, excessive use of fertilizers, industrial wastes, mining wastes, and untreated polluted water in agricultural areas (TMMOB Çevre Mühendisleri Odası, 2018, p.23-24). Soil pollution occurs when garbage from residential areas is discharged indiscriminately and in areas where sewage networks are directly discharged without treatment. As a result of the unconscious and excessive use of artificial fertilizers containing nutrients such as phosphorus, sodium, iron, potassium, magnesium, zinc, copper, and boron, the structure of the soil deteriorates and leads to soil pollution.

Another environmental problem related to soil pollution is erosion. The soil erosion caused by forests' destruction, irresponsible use of rangelands and pastures, overgrazing of animals is one of the most critical environmental problems in Turkey. There is moderate and severe erosion available in 54% of the forest area, 59% of farmland, and 64% of pastures in Turkey (T.C. Tarım ve Orman Bakanlığı).

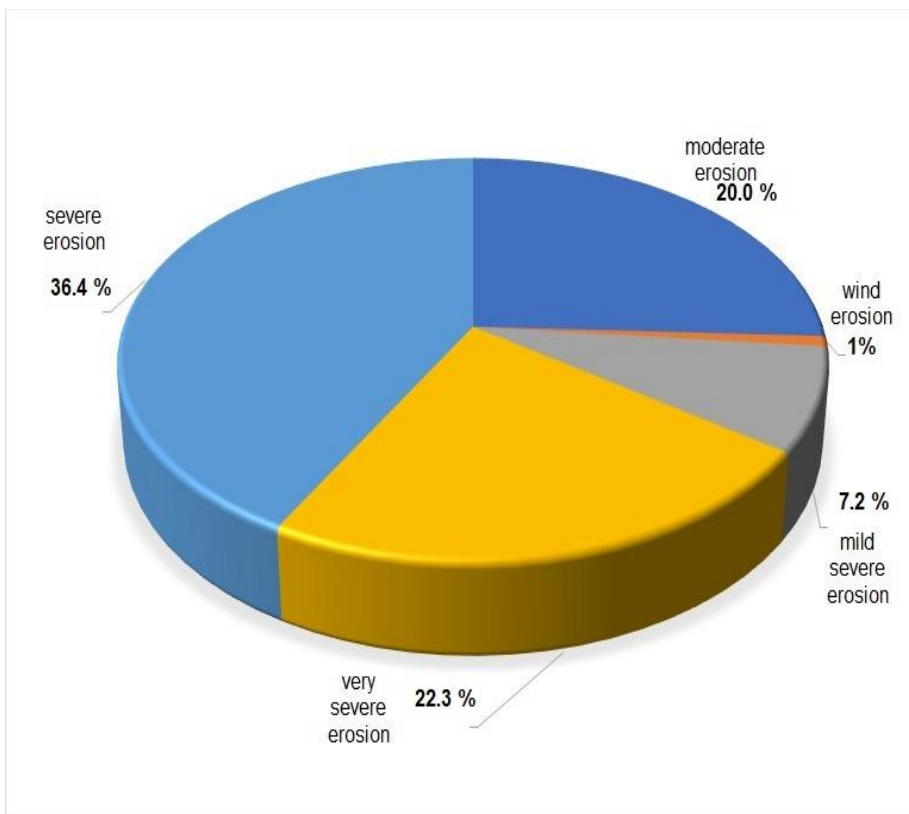


Figure 5. Erosion Situation in Turkey (Source: <https://www.tarimorman.gov.tr/CEM/Belgeler/collesme%20belgeleri%20arsiv/Sayfa02/CEMxBROSxTR.pdf>)

According to the "Climate Change and Land Special Report" published by the Intergovernmental Panel on Climate Change (IPCC) in August

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2019, soils are poorly used worldwide, and land degradation causes an 11-14 % reduction in biodiversity. Tillage methods, which widely used in agricultural lands, cause erosion. Deforestation, land degradation, overgrazing, and global warming increase erosion further. Simultaneously, agricultural and forestry activities, which are misapplied, are responsible for 23% of the increase in greenhouse gas emissions that affect climate change. Decreasing soil productivity due to erosion threatens food security and negatively affects the well-being and health of individuals(IPPC, 2019).

3.6. Noise Pollution:

Noise pollution is a type of pollution caused by unwanted and annoying sounds. The leading causes of noise pollution are that recreational areas and workplaces remain within settlements, highways, and ring roads pass through the city center and settlements, population growth, and urbanization. Indeed, it has identified by the research that the origin of 80 % of the noise in urban areas in Turkey has identified as traffic (Çevre ve Şehircilik Bakanlığı, 2017). Among the provinces where noise pollution is the priority problem are Istanbul, Adana, Antalya, and Eskişehir, where tourism businesses and entertainment venues are concentrated.

The relationship between noise pollution and environmental safety is due to the negative impact of noise on human health. Exposure to noise for a long time causes discomfort, sleep disturbance, adverse effects on the cardiovascular and metabolic system, and can cause various health problems such as cognitive impairment, especially in children. According to studies, it estimated that environmental noise causes 48,000 new ischemic heart disease cases and early deaths of 12,000 people annually. However, exposure to excessive noise causes 22 million people to suffer from chronic illnesses and 6.500.000 people to suffer from chronic sleep disorders. It also estimated that 12,500 school children have reading impairment at school due to aircraft noise (European Environment Agency, 2020, p.1-2).

Therefore, the first legal regulations for environmental noise control in Turkey were made by the year 1983, and Environment Law No. 2872 has been accepted. Based on this law, the first technical regulations made with the "Noise Control Regulation" dated 1986. Later, this regulation was harmonized with the European Union Directive and was published on June 4, 2010, under "Environmental Noise Assessment and Management Regulation."The purpose of the Regulation; *"To ensure that the necessary measures taken to ensure that the peace and tranquility of people as a result of exposure to environmental noise and their physical and mental health are not damaged, to prevent and control the environmental vibration that will occur in susceptible and sensitive structures"* (Kunt, Gürbüzler, Erkal, Hacıhasanoğlu & Özer, 2016, p.47).

4. Turkey's Policy Against Environmental Problems

As stated in the previous section, unplanned urbanization as a result of population growth; weather, water, soil, and noise pollution as a result of industrialization; and other environmental problems which leads to deterioration of the natural balance have emerged in Turkey in parallel with the increasing environmental issues since the beginning of the 1970s. Turkey also feels the effects of climate change are affecting the entire world. The measures taken for environmental problems in Turkey are not very old. The Environment Conference carried out under the leadership of the United Nations in 1972 has contributed to the development of environmental policies in Turkey. When we look at the pre-1972 development plans of Turkey, we can not see any regulation and information regarding environmental policies. However, by 1973, environmental problems were included in the third five-year development plan. Nevertheless, it was emphasized in development plans of Turkey that it would not accepted that environmental policies created to solve environmental problems would harm development and industrialization activities (T.C. Strateji ve Bütçe Başkanlığı, 1973, p.864-867).

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One of the most essential arrangements relevant to the environment made in Turkey in 1982 is Article 56 of the Constitution. According to Article 56, “*Everyone has the right to live in a healthy and balanced environment. The state and citizens have to improve the environment, protect environmental health and prevent environmental pollution*” (T.C. Anayasası, 1982). Despite the fact that Turkey legally talking about environmental health and pollution, it has made investments that giving rise to the degradation of natural resources such as water, air, and land to improve its industry like many other emerging countries. Turkey's national environmental policy began with Environmental Law No. 2872 came into force in 1983. According to this environmental law, it is forbidden to release all kinds of waste to the environment in a way that will harm the environment, disturbance of the environmental balance with excessive and unconscious use of the soil, endangering the existence of animal and plant species, and destroying the integrity of natural resources (Çevre Kanunu, 1983). Besides, environmental protection has tried to achieved with laws such as the General Sanitation Law, the Forestry Law, the Law on Soil Conservation, and Land Use. In 1991, the Ministry of Environment established, and the effects of sustainable development, which are new environmental policy discourses, began to emerge. Brundtland Report, published in 1987, and sustainable development, after the 1992 Rio Conference, have begun to influence Turkey's environmental policies (Orhan, 2013, p.18).

Another critical factor influencing Turkey's environmental policy is Turkey's full membership process to the European Union. Turkey has efforts to comply with the Environmental Policy of the European Union as a necessity of harmonization with the European Union. The European Union's Environmental Policy covers regulations in air quality, water quality, control of industrial pollution, waste management, nature protection, chemicals, climate change, and noise pollution (Aydın & Çamur, 2017, p.28-31).

With this process, Turkey has signed the Kyoto Protocol as part of the EU acquis. The Kyoto Protocol was signed in 1997 to reduce the emission of greenhouse gases (T.C. Çevre ve Şehircilik Bakanlığı, 1998). Turkey became a party to the Kyoto Protocol In 2009(T.C. Çevre ve Şehircilik Bakanlığı).

Turkey continues to give place to the environmental problems in the current development plans. For example, it stated in Turkey's 2019-2023 Development Plan, the Climate Change Action Plan for Turkey's seven regions will be prepared (T.C. Stratejik ve Bütçe Başkanlığı, 2019, p. 183).

It targeted in line with this action plans that drought management plans to done for Turkey's 25 river basins for the protection of water and for the efficient use of water (T.C. Stratejik ve Bütçe Başkanlığı, 2019, p. 178). The same report contains articles that include air pollution associated with climate change. According to the action plan, infrastructure studies will developed for monitoring air quality. While the number of air quality monitoring stations was 339 in 2018, it planned to increase to 380 in 2030. Besides, it planned to form air quality action plans at the local level, and it stated that the legislation for pollution and emission control will be updated accordingly (T.C. Stratejik ve Bütçe Başkanlığı, 2019, p. 184-185).

Despite all these developments and regulations, environmental problems continue to increase in Turkey. It is important to note that Turkey gives priority to economic, political, and development issues according to international conventions to which Turkey joined (Arat & Türkeş, 2012, p. 27). Due to all these priorities, the issue of environmental problems remains in the background. Despite the legal and institutional arrangements, environmental pollution and other environmental problems continues to exist in Turkey. Considering water pollution; The pollution of seas, lakes, and rivers also stated in official reports. In terms of air pollution, Turkey is one of Europe's most polluted regions, and health problems experienced due to air pollution.

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Although many reports such as official statements and development reports mention the number of treatment facilities and the number of these facilities will increased, the water pollution problem cannot be solved yet. Besides, increasing the number of solid waste storage facilities is not enough to reduce solid waste (Orhan, 2013, p. 14).

Although there are discourses on combating climate change, the construction of power plants contributing to greenhouse gas emissions continues. The fact that Turkey is still not participating in the Paris Convention, which included in the United Nations Framework Convention on Climate Change, causes further problems. Although given as a discourse on environmental issues in Turkey and the legal framework, the reason behind the gradually increasing environmental security problems is that these efforts remain inadequate due to Turkey's development policy and economic concerns. Turkey's economic growth concerns hinder the environmental problems from being seen as a priority issue and to addressed due to Turkey being a developing country. However, environmental problems can adversely affect economic development, social structure, and political order.

Therefore, it is a requirement for increasing awareness of environmental problems to be addressed the environmental security threats caused by environmental problems as a priority issue and to create awareness both at the state level and atthe individual level in Turkey. Therefore, it is a requirement for environmental problems to be addressed the environmental security threats caused by environmental problems as a priority issue to create awareness of both at the state and individual levels in Turkey.

Conclusion

With the emergence of new international challenges after the Cold War, the relationship between environmental change and environmental degradation has become increasingly important. With the increase in security threats and risks globally, the scope of security has also expanded.

The environmental issue has always had a complex and long history. Although it has such a long history, it has not attracted attention in academic circles and the international era for many years. However, with population growth, industrialization, and technological developments, environmental problems have unlimited structure. With the discovery of features of environmental issues such as the eternal nature of environmental problems and the difficulty of predicting the consequences, the connection of the environment with security has begun to be established. Thus the concept of environmental security has emerged. Environmental security; It is a security approach that deals with environmental stress, environmental degradation, and their consequences. Environmental security includes various potential threats to society, such as environmental degradation, resource scarcity, ecosystem degradation, or environmental pollution.

Every country is affected and struggled differently by the uninhibited nature of environmental problems. There are differences between developed and developing countries in dealing with environmental problems. Developed countries have more opportunities to develop technologies that can cope with environmental problems, thanks to their strong economies. Developing and underdeveloped countries are more sensitive and vulnerable to environmental problems. As a developing country, Turkey has had to contend with environmental problems.

Turkey's environmental problems have become apparent rapidly along with the growing population in years, industrialization, and urbanization. In recent years, Turkey felt more than ever the effects of widely seen environmental pollution species such as water pollution, air pollution, soil pollution, noise pollution, along global warming and climate change. All these environmental problems show their reflections in health, economic and social life.

Determination of priority environmental problems of Turkey is essential for combating environmental problems. In fact, Turkey joined the international agreement on environmental issues and has been

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developing policies against environmental problems. However, Turkey's priorities are economic and political issues. For this reason, policies regarding environmental problems cannot provide effective solutions. However, Turkey must take environmental problems seriously and provide permanent solutions to developed in many areas such as economic development and social development.

When we evaluate environmental risks and environmental security threats faced by Turkey in the context of the environmental security approach for the study, Turkey is unlikely to meet instability and conflict within the country and with other countries as a source of environmental problems under the current conditions. Homer-Dixon also states that environmental problems do not cause conflict, but environmental problems will have an accelerating effect in developing countries if there is an internal conflict or inter-state conflict or potential conflict for another reason.

Until now, Turkey only had problems sharing the waters of the Tigris, Euphrates, and Orontes rivers with Iraq and Syria and has come to the brink of conflict. However, Turkey is having problems with Syria and Iraq at various times in the other areas rather than the water problems. When Turkey, Syria, and Iraq have had a problem with the sharing of Tigris, Euphrates, and Orontes river waters, they were having problems among these countries for other reasons at the same period. However, with the improvement of political relations between Turkey, Iraq, and Syria, the water sharing issue of Euphrates, Tigris, and Asi rivers dropped from the agenda, and the water sharing issue did not lead to an armed war between Turkey and Iraq and Syria.

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