REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

6TH STATE OF ENVIRONMENT REPORT FOR REPUBLIC OF TURKEY

GENERAL DIRECTORATE OF ENVIRONMENTAL
IMPACT ASSESSMENT, PERMIT AND INSPECTION

ANKARA - 2020

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"PREVENTIVE MEASURES SHOULD BE TAKEN BEFORE THE HAPPENING OF DISASTERS, OTHERWISE IT'S USELESS TO LAMENT AFTER DISASTERS OCCURED"

Mustafa Kemal ATATÜRK

We regard everything in the world, from air to water, from its trees to stones and soil, as a blessing offered to mankind to man.

As responsible individuals, our most important duty is to protect and develop the blessing in the best way until it is handed over to the new generations.

However, environmental degradation and global climate change are becoming an ever greater threat to the future of humanity.

Turkey is a country with great determination to realize policies necessary for the protection of nature, without turning away from her development goals.

We have carried out works of historical importance on issues such as environmental management, climate-friendly technology, use of nature and energy resources, improvement of air-water-soil quality, especially in the last 18 years.

We prepared action plans at the regional and provincial levels and implemented them with the idea that the protection of the environment without deterioration and the successful fight against climate change depends on local efforts.

We have re-planned our cities with smart and environmentally friendly technologies.

As we enter the 100th anniversary of our Republic, we are getting closer to our goal of bringing 81 million square meters of nations gardens to our 81 provinces and maximizing our green area per person.

As a result of the love of nature, which is an integral part of our civilization understanding, we will continue to implement our human and environment-oriented policies in the most powerful way.

I believe that "The State of the Environment Report of Turkey", which is an evaluation of the recent four-year data and information by our Ministry of Environment and Urbanization, will make it easier to understand our country's efforts and progress in this field.

I hope that the report will contribute to increasing our environmental awareness and to our citizens' access to accurate and reliable information.

Recep Tayyip ERDOĞAN
The President

The year 2020, which we are approaching the final days, has been a year of exams and accounting for our world. In particular, the Global Covid-19 outbreak has shown to the whole human world how important and determining the need for a balanced relationship between man and nature is.

Humankind has dramatically experienced the consequences of irreversible damages to the environment, nature and biological diversity.

Climate change is the result of all activities of human beings that pollute the air, nature, lakes, rivers, forests, green areas and consume natural resources irreparably. Today, the world faces one of the biggest climate crises in history.

Turkey is aware that we live in an earth with limited natural resources and an overly sensitive ecosystem capacity.

We see our nature and our environment not as an object of consumption, but as a unique relic in which all kinds of blessings are presented in abundance.

We must urgently minimize our ecological footprint and reduce the negative effects of environmental pollution and global climate change.

For this reason, using our aboveground and underground resources consciously on behalf of our citizens, our future and our children should be one of our greatest responsibilities today as it was yesterday.

The way to effectively and efficiently combat environmental problems is to constantly review the current situation, develop solution-oriented and strong policies, and implement all these together with our local governments and citizens.

For this purpose; "The State of the Environment Report of Turkey", being prepared quadrennially by the Ministry of Environment and Urbanization, is very precious and valuable in terms of showing the relationship between institutions and sectors related to the environment and presenting the works carried out in the environmental field throughout the country and the results of those.

I would like to express my thanks to all my colleagues and representatives of all institutions and organizations contributed to the preparation of this source that includes extremely important information for our environment, our nature and a healthier Turkey.

Murat KURUM
The Minister of Environment and Urbanization

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ABBREVIATIONS INDEX

LULUCF	Land Use, Land Use-Change and Forestry
BAGİS	Fishing Vessels Monitoring System
UNFCCC	The United Nations Framework Convention on Climate Change
BOTAŞ	Petroleum Pipeline Corporation
CLRTAP	Convention on Long-Range Transboundary Air Pollution
ÇATAK	Environmentally Based Agricultural Land Protection
MoEU	Ministry of Environment and Urbanization
DHMİGM	The General Directorate of State Airports Authority
MSFD	The EU Marine Strategy Framework Directive
SHW	The General Directorate of State Hydraulic Works
DGEA	The Directorate General of Energy Affairs
FEE	Foundation for Environmental Education
SPP	Solar Power Plants
IMO	International Marine Organization
IUCN	International Union for Conservation of Nature
PRTR	A Pollutant Release and Transfer Register
MGM	Turkish State Meteorological Service
MAPEG	General Directorate of Mining and Petroleum Affairs
MTA	General Directorate of Mineral Research and Exploration
Mtoe	Millions of tonnes of oil equivalent
NIBIS	Nitrate Information System
OECD	The Organisation for Economic Co-operation and Development
OPRC	The International Convention on Oil Pollution Preparedness, Response and Co-operation
REACH	Registration, Evaluation, Authorization and Restriction of Chemicals
WPPM	Wind Energy Potential Atlas
WPS	Wind Power Stations
CEMS	Continuous Emission Measurement Systems
SUEN	Turkish Water Institute
TAGEM	The General Directorate of Agricultural Research and Policies
TKI	The Turkish Coal Enterprises
TURKSTAT/TUİK	Turkey Statistical Institute
TÜBİTAK	The Scientific and Technological Research Council of Turkey
FMP	Flood Management Plan.
UDEM	National Maritime Safety and Emergency Response Centre
NEEAPs	National energy efficiency action plans
LCCAP	Local Climate Change Action Plan

EXECUTIVE SUMMARY

1 EXECUTIVE SUMMARY

The organization, duties and authorizes the Ministry of Environment and Urbanization regulated in accordance with the Presidential Decree No. 1 concerning the Presidential Organization, dated as 10.07.2018. Paragraph (h) of the Article 104 of the Decree, determining the duties of the General Directorate of Environmental Impact Assessment, Permit and Inspection, includes a provision of "preparing the environmental inventory and state of the environment reports". As a result of this duty, the State of Environmental Report of Turkey is prepared quadrennial by the Ministry of Environment and Urbanization.

The first of these State of Environmental Reports of Turkey, designed primarily to serve the purposes of guiding decision makers, developing a general point of view on the period that it is belong to, presenting the status quo of the environment and comparing pre and post period of the report, was prepared in 1997 as "Environmental Atlas of Turkey" and stage the sixth of those has been prepared.

While "The 6th State of Environmental Report" comprises the years between 2016 and 2019, there are also some data and information concerning the years 2014 and 2020, especially for some sectors. In addition to the above mentioned objectives, the subject report is critical in terms of evaluating whether the objectives underlined in the 11th Development Report achieved or not.

6th State of Environmental Report of Turkey comprises the chapters respectively following the section of general overview of our country; Air and Climate Change, Water and Wastewater Management, Waste, Management of Chemicals, Nature Conservation and Biological Diversity, Land Use, Organizational Structure and Activities of the Ministry of Environment and Urbanization and Environmental Expenses and Liability Insurance.

The chapter of GENERAL OVERVIEW OF TURKEY involves a brief relevant to the general situation in of our country. Turkey covers a wide geographical range with a population of 83,154,997 inhabitants and with projected area of 779,578 km²in reference to 2019 results.

When considered the Natural Sources; Turkey has been placed the 28th in terms of total amount of mine production based on the mine diversity and reserves among 132 mine producing countries in the world and the 10th in terms of diversity of the mine produced.

By the end of the year of 2019, 57% of the total installed power has pertained to Solar Energy Power Plant. In our country, total sun collector field has been calculated as approximately 20,200,000 m² as of 2018. Approximately 876,72 thousand TOE (Tons of Oil Equivalent) thermal energy was produced by means of these sun collectors in 2018. According to the Wind Energy Potential Map, wind energy potential of Turkey has been estimated as 48,000 MW. Total area corresponding to this potential is 1.30% of the total acreage of Turkey.

While the forest area in Turkey was reported as 20,2 million hectares (26,1%) in the first inventory period of 1963-1972, it was 22.7 million hectares (29.2%) in 2019, the last inventory year. According to the results of this inventory, it is seen that approximately 2.5 million hectares of forest area have increased in the last 47 years. 12,002,335 hectares were identified, 8,258,011 hectares of restraint, and 5,035,091 hectares of allocation work were carried out within the scope of the Pasture Law as of 2019. Besides, rehabilitation work was carried out in the area in 10,510,691, for which detection and restraint work was completed.

In the energy sector, the installed power of Turkey's electric energy has reached up to 91,267 MW as of the year 2019. Owing to the incentives provided to renewable energy sources, the share of the renewable energy sources, especially hydraulic, wind, sun and geothermal in the installed power has increased since 2008. The installed power of our country has been comprised of 49.05% renewable energy sources and 50.95% the other energy sources by the end of the year 2019. The installed power of hydraulic energy has reached up to 28,503 MW by the end of the year 2019. According to the unascertained data, approximately 304,3 TWh electric power was produced in 2019. While the share of natural gas in the electric power production was 30.34% by the end of 2018, this share decreased to 18.64% by the end of 2019. The source of the electric power produced was 29.21% from hydroelectric power station, 17.33% from domestic coal, 19.85% from imported coal, 7.16% from wind and 2.93% from geothermal sources.

Primary energy supply of our country was 143.7 million TOE in 2018. This primary energy supply was comprised of 28.7% natural gas, 28.4% coal, 29.17% petroleum and 13.7% renewable sources.

When considered the tourism; according to the statistical data of World Tourism Organization, Turkey was the 6th in the World and 4th in the Europe in 2019 in terms of the number of tourists. In the same year, Turkey was the 6th in the world countries ranking list and 4th in Europe in terms of tourism incomes.

When considered the agriculture; apart from the current agricultural practices, the project on extending and controlling organic agriculture systems has been carried on since 1997. The organic agriculture practices were commenced with the production area of 57,365 ha in 2002 and increased to 545,869 ha in 2019. The good agricultural practices were commenced with the production area of 53,607 da in 2007 and increased to 5,396,073 da in 2019. Our objective is to increase the production area of the organic agriculture, which commenced with 57,365 ha in 2002 and increased to 545,869 ha as of 2019, to 1,250,000 ha and the number of the farmers from 74,545 (as of 2019) to 125,000 and raise the share of organic agricultural areas from 2.36% (as of 2019) to 5% as of 2024.

In the chapter of AIR; when the data on the state of the emissions between 1990-2018 covered by 2020 Reports of National Emissions Inventory is examined, it is observed that there has been a substantial decrease, especially in combustion-related pollutants in the last year. This decrease was caused by the reduction in fuel consumption in power plants and updated emission factors due to changing technologies. The highest increase was experienced in (200%) NO_X emissions compared to 1990 and followed by SO_2 (46%), NH_3 (23%) NMVOC (21%) emissions, respectively. Moreover, decreases were observed in PM_{10} (16%) and CO (22%) emissions. When the national emissions of 2020 is analyzed; it's seen that

SO_2 emissions was due to 70.4% electric power plants and 9% domestic heating. NO_X emissions were caused 45.7% electric power plants. 21.7% of NMVOC emissions was due to livestock sector. And the major cause of NH_3 emissions was manure management.

The Ministry of Environment and Urbanization have established air quality measurement stations in the 81 provinces in order to monitor the countrywide air quality. While the National Air Quality Monitoring Network commenced with 35 stations in 2005, the number of the stations has increased to 355 as of July, 2020. In accordance with the results of the measurement conducted by the air quality measurement stations across Turkey between the years of 2015 and 2019; 16% improvement was achieved in PM_{10} parameter and 37% improvement was achieved in SO_2 parameter.

When considered the Noise Management; the number of the provinces of which noise map should be prepared throughout the country within the framework of By-Law on Assessment and Management of Environmental Noise is 66. Noise maps of 46 provinces have been prepared by the end of 2018 within the context of the national and international projects conducted by the Ministry of Environment and Urbanization. The remaining number of the provinces of which noise map should be prepared is 20. Furthermore, strategical noise maps of 49 airports have been prepared.

In the chapter of CLIMATE CHANGE; primarily meteorological data, which has critical indicators, draws attention. When temperature variations between years of 1970 and 2019 are analyzed, variations in temperatures have been experienced since 1993 except for 1997 and 2011. As 935 extreme incidents were experienced in 2019, it has been the year with highest number of incidents. There has been an upward trend in the extreme incidents for the last twenty years. 36% of the recorded extreme incidents in 2019 were heavy rainfall/flood and 27% of those were storm.

The fundamental policies and measures in combating climate change focus on the sectors of energy, transportation, industrial processes, agriculture, waste and land use, and forestry.

Turkey adopted the Paris Agreement on Climate Change in December 2015 within the context of the 21th session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and signed the Agreement on 22 April 2016. Studies relevant to our country's national contribution to the Paris Climate Agreement, which entered into force as of 2020, have been completed and submitted to the UNFCCC Secretariat before the adoption of the Agreement on 30 September 2015. Pursuant thereto; Turkey has committed to reducing greenhouse gas emissions by up to 21% in 2030. According to our national contribution, 246 million tons of greenhouse gas emissions will be prevented in 2030, and a total of 1 billion 920 million tons between 2012 and 2030.

Although, the rate of energy sector emissions increased by 167.3% in 2018 with reference to 1990, it decreased by 1.8% with reference to the previous year and calculated as 373,1 Mt CO_2 equivalent resistance. The rate of industrial processes and product use emissions increased by 185.5% with reference to 1990 and by 2.5% with reference to the previous year and calculated as 65.2 Mt CO_2 equivalent resistance.

The rate of agriculture sector emissions increased by 41.5% with reference to 1990 and by 3.2% with reference to the previous year and calculated as 64,9 Mt CO_2 equivalent resistance and the rate of waste emissions increased by 60.3% with reference to 1990 and by 2.1% with reference to the previous year and calculated as 17.8 Mt CO_2 equivalent resistance.

In accordance with the inventory results; total greenhouse gas emissions were calculated as 520.9 million tons (Mt) as equivalent of CO_2 in 2018. As the energy sourced emissions got the biggest share

as equivalent of CO_2 in 2018 emissions, they are followed by industrial processes and product use, agricultural practices and waste, respectively.

The Ministry of Environment and Urbanization has controlled and terminated the importation of ozone-depleting substances (ODS), which are not produced in our country, under the By-law on Ozone Depleting Substances (ODS). ODSs are allowed to enter the country within the framework of the quota determined by decreasing every year and they are monitored by the electronic tracking system of the Ministry from the import phase to their use in our country at the service phase. The amount of ODSs quota, which had been allowed to be imported as quota since 2009, decreased to 100 tons in 2020.

In the chapter of WATER AND WATER WASTE MANAGEMENT, data and information relevant to the water resources, environmental infrastructure and pollution prevention activities attract attention.

When considered the water resources, it is clearly seen that Turkey is not a water rich country and has been experiencing water shortage according to the annual amount of water per capita. According to the calculations by SHW, Turkey has an annual water potential of 1,652 m^3 per capita. It is predicted that the population of Turkey will have reached up to 100 million in 2030 and the amount of water potential per capita will have decreased to 1,120 m^3. As a consequence, Turkey will be among the countries suffering from water shortage and will have to follow policies that will enable effective use of the resources.

It is highly important to conduct planning process to protect the water resources and pass fresh and enough water by using the sources sustainably on to the next generation. River Basin Management Plans have been prepared for the 8 of the 25 river basin of our country and planning process relevant to 3 river basins are still ongoing. The River Basin Management Plans are planned to have been completed since 2023 and it's going to be updated evert six-year period.

River Basin Action Plans have been prepared and launched for 25 river basins as of 2014 within perception of integrated river basin management. During the preparation process of River Basin Action Plans, plans, programs and priorities of the activities for the measurements to be carried out in the short, medium and long period within the framework of 15 action plans were prepared.

Provincial Action Plan on Marine Letter for 28 provinces with coastal areas have been prepared since the beginning of 2020 and published on the websites of Provincial Directorates for Environment and Urbanization. Under the Zero Waste Blue Program, 65,250 tons of marine litter was collected and delivered to disposal in 2019 and 7.517 tons of those have been collected and delivered to disposal in the first 9 months of 2020. In Turkey, the number of coastal facilities with an approved Emergency Response Plan increased from 216 in 2012 to 364 in 2019.

Under the Blue Flag Program, the number of the beaches with blue flag in Turkey was 355 in 2012, this number was increased to 486 in July of 2020.

The number of the municipalities with the service of sewerage systems and wastewater treatment plant and the population provided with these services have considerably increased owing to the environmental protection oriented activities carried out within the context of Environmental Wastewater Infrastructure program and technical and financial support provided by the Ministry. While the ratio of the population provided with service of sewerage systems to the municipality population was 69% in 1994, it reached up to the rate of 90% in 2014 and to 91% in 2018. While 13% of the municipality population provided with wastewater treatment plant, this rate increased to 68% at the end of 2014 and to 79% in 2018.

The number of the plants obtained Repayment Documents in order to benefit from Electricity Incentive reached up to 773 at the end of the year of 2019. Within the scope of the By-Law; 22.8 Million TL was refunded to 172 plants in 2011 and 103.6 Million TL was refunded to 567 plants in 2019. In accordance

with the inventory activities carried out by the Ministry of Environment and Urbanization, a total of 104 Organized Industrial Zones out of 236 have Wastewater Treatment Plants, 58 of those are connected to municipal sewerage systems and project and construction efforts for the wastewater treatment plants in 74 Organized Industrial Zones are still in progress. 74 Organized Industrial Zones do not have any wastewater treatment plant.

Project Approval Procedures for 4,397 Wastewater Treatment Plants were conducted by the Ministry of Environment and Urbanization between the years of 2004 and 2020 and 1,041 of them were conducted by General Directorate of Environmental Management. The Wastewater Treatment Action Plan (WWTAP) comprising the years between 2008 and 2012 has been updated so as to comprise the years between 2014 and 2023. It is envisaged to construct a total of 1,422 Wastewater Treatment Plants (1,326 new WWTFs and 96 WWTFs to be renewed) between 2017-2023 with the WWTP.

30,382 tons/ KM/year sewage sludge, produced in different wastewater plants between the years of 2016 and 2019, were allowed to be used in 4,815.5 decares land within the context of the By-Law on the Use of Domestic and Urban Sewage Sludge in the Soil.

Contaminated Sites Information System has been developed under the By-Law on Soil Pollution Control and Point Source Contaminated Sites and enables the systematic structuring, updating, and sustainability of inventory information for point source contaminated sites and providing rapid access to this information when necessary. Totally 38,067 owners of the activity logged in the system.

The network for monitoring the pollution by nitrates from agricultural sources has been established to detect agricultural pollution and identify the Nitrate Sensitive Areas and has been expanded to fully represent the agricultural pollution in the country. Accordingly, monitoring studies were conducted in the waters regarding the pollution by nitrates from agricultural sources in a total of 4,807 stations (2,493 of them are surface water and 2,314 of them are groundwater).

WASTE MANAGEMENT is one of the critical issues relevant to the environment and includes the issues such as reducing the wastes from the environment they originated, segregating them according to their qualities, transferring them to the storage areas, bringing them recycling, eliminating and finally controlling them.

The amount of the municipal wastes collected in Turkey was approximately 32,2 million tons/year according to 2018 statistical data. The amount of regularly stored wastes increased up to 67.2% and the amount of recycled waste is 12.3% in accordance with statistical data of TURKSTAT.

When considered generally, all in all, packaging wastes make up 30% of the wastes by weight and 50% of the wastes by volume. The municipalities have been liable at planning the packaging waste management plan indicating how, when and in what way the packaging wastes should be collected since 2008 and the number of the municipalities approved the Packaging Waste Management Plan has been 420 as of 2018. 731 Waste Collection and Segregation Facilities and 1,128 Recycling Facilities have obtained Provisional Certificate of Operation/ Environmental Permit Certificate from the Ministry of Environment and Urbanization as of 2018.

In regard to the declarations of Waste Declaration System of the Ministry of Environment and Urbanization, 66,478 plants/facilities produced 1,513,624-ton hazardous wastes; 1,286,363-ton of them were recycled, 200,767-ton of them were disposed of, 9.060-ton of them were exported and 17,434-ton of them were in stock as of 2018. Furthermore, 70,130-ton waste mineral water and 13,170-ton vegetable oil were produced in 2018.

27,269-ton end-of-life tires and 23,365-ton waste electrical and electronic equipment were collected in 2018.

Considering 2020 statistical data of the Ministry of Environment and Urbanization relevant to the end-of-life vehicles, there are 513 licensed delivery points and 177 provisional storage facilities that have Provisional Certificate of Operation/ Environmental Permit Certificate from the Ministry. The number of the vehicles recorded in End-of-life Vehicles Disposal Tracking System to be scrapped was 15,516 in 2016 and 295,709 in 2019.

In regard to the declarations of Waste Declaration System of the Ministry of Environment and Urbanization, 15,068,633-ton nonhazardous wastes were produced; 9,749,190-ton of them were recycled, 3,211,222-ton of them were disposed of, 208,800-ton of them were exported and, 1,899,421-ton of them were in stock as of 2018.

In regard to the declarations of HWDS, 85,987-ton medical wastes were produced in 2017 and 89,454-ton of those were produced in 2018. Service has been rendered in total 64 medical waste sterilization plants as of September, 2020. Moreover, there are 3 combustion plants where these medical wastes are disposed.

While the number of the facilities licensed by the Ministry of Environment and Urbanization was 18 in 2005, today 163 Waste Receiving Facilities have been rendering waste reception service to the vessels in 305 coastal facilities as of September, 2020.

Alternative raw material usage approvals were given for 67 waste codes in the cement sector, 5 waste codes in the brick sector, 1 waste code in the glass sector, 2 waste codes in the concrete sector, and 1 waste code in the lime sector in parallel with the "Waste Recovery" awareness of our industrialists. Furthermore, use of 8 different types of wastes in 26 facilities as waste products was approved at end of 2019.

In accordance 2018 survey study conducted by TURKSTAT, mine works produced 812 million-ton mining wastes in 2018 (811 million-ton in 2016). 99.9% of these 812 million-ton mining wastes originated from the mining works in 2018 was mineral wastes. It was determined that the amount of stripping waste/ tailings was 795 million-ton (802 million-ton in 2016) and total amount of hazardous waste was 11,177 thousand-ton.

The Zero Waste Publicity Meeting was hold by the Ministry of Environment and Urbanization on 26.09.2017 and the project was launched to be conducted throughout Turkey. Two institutions (Presidency of Republic and the Ministry of Environment and Urbanization) in 2017, 13,000 institutions and organizations in 2018, 27,000 institutions and organizations in 2019 and 47,750 institutions and organizations in 2020 (October) run, carry out the Zero Waste scheme in their service buildings. Again, within this scope, approximately 10,000 people were trained in 2017, approximately 400,000 people in 2018, approximately 2,500,000 people in 2019, and approximately 8,833,000 people in 2020.

By-Law on Classification, Labelling and Packaging of Substances and Mixtures (CLP) relevant to the Management of Chemicals aims at establishing a common hazardous communication and ensuring safe use of chemicals, lowering the cost of eliminating the environmental pollution and health problems caused by hazardous effects of chemicals, minimizing accidents involving chemicals and preventing technical obstacles in commerce.

Within the framework of By-Law on CLP; importers and exporters of the chemicals send the notices relevant to classification, labelling and packaging of the chemicals they imported or exported to the online Chemicals Record System (CRS) under the Integrated Environmental Information System. 46,279 notices for approximately 13,069 chemical substances have been sent to CRS since July, 2020.

The chapter of NATURE PROTECTION AND BIOLOGICAL DIVERSITY covers the issues of combating erosion and desertification, in addition to protected areas and the biological diversity of Turkey.

It can be said that the biological diversity of Turkey is since it possesses agricultural, forest, mountain, steppe, wetland, coastal and marine ecosystems and holds different forms and combinations of these ecosystems, and this ecosystem and habitat diversity brings along a significant variety of species.

Although the number of plant species throughout the European Continent is 12,500, the number of the plant species detected in Turkey reaches to that number. Approximately 3,000 of these species are endemic to Turkey. Although there are around 60,000 flora and fauna species in Europe, this number is nearly 80,000 in Turkey.

There are approximately 150 mammal species, 480 bird species, 130 reptile species and 300 fish species in Turkey. 15 of mammal species, 46 of bird species, 18 of reptile species and 5 frog species are under threat of extinction. In spite of insufficient data, invertebrates have the biggest share within the identified species. There are around 19,000 invertebrate species in Turkey and nearly 4,000 of them are species/sub-species endemic. The total number of vertebrates identified so far is about 1,500. Over 100 of vertebrates – 70 of them are fish species – are endemic species. Since Turkey is located on two major migration routes of birds, it is of great importance as a feeding and breeding site for birds.

Turkey's Protected Areas are comprised of Natural Protected Area, Specially Protected Environment Area, Wildlife Protection and Improvement Area, Wetland Area, Natural Park, Nature Reserve Areas, Protection Forest and Natural Monument. Protected Areas in Turkey covers an area of totally 7,916,937.46 hectares. This area comprises of 1,903,823 ha Natural Protected Areas, 2,585,940 ha Specially Protected Environment Area, 880,019 ha Natural Parks, 1,173,357 ha Wildlife Protection and Improvement Areas, 958,883 ha Wetland Areas, 107,306 ha Natural Parks, 46,726 ha Natural Reserve Areas, 9,390 ha Natural Monuments and 251,493.46 ha Protection Forests.

There are 44 National Parks, 30 Nature Reserve Areas, 247 Natural Parks, 116 Natural Monuments, 84 Wildlife Protection and Improvement Areas and 2,751 Natural Protected Areas in Turkey as of 2020.

While there were 16 Specially Protected Environment Area (covering an area of 2,458,749 hectares) in 2015, this number increased up to 18 Specially Protected Environment Area (covering an area of 2,585,940 hectares) in 2020.

59 wetlands (covering an area of 869,697 ha) have been registered as Wetlands of National Importance and 13 wetlands (covering an area of 14,513 ha) have been registered as Wetlands with Local Importance within the scope of the By-Law on the Protection of Wetlands published in the Official Gazette No. 28962 dated 04.04.2014. Moreover, there currently 17 wetlands (covering an area of 184,487 ha) within the context of RAMSAR.

"Monumental trees" and "caves" are values belonging to the geological periods, prehistoric and historical periods, which are above ground, underground or underwater and which need to be protected for being rare or in terms of their characteristics and beauties. Thus, they have been taken under protection as Natural Assets. Total number of the registered trees are 9,092, that of registered caves are 231 in Turkey as of 2020.

Dynamic Erosion Model and Monitoring System (DEMIS) software has been developed within the framework of Combating Erosion in order to monitor dynamically the erosions occurred in Turkey and define the policies directed at taking necessary precautions accordingly. The statistical data relevant to the amount of the sediment dislocated as a result of water erosion and the factors causing these losses were presented into the scale of 81 provinces and 25 main waters basins by means of this software developed. Afforestation, erosion control, rehabilitation of degraded forests and pasture improvement, energy forests establishment, artificial regeneration and special afforestation activities had been conducted

on 9,800,000 ha area until the end of 2019. While 1,550,000 ha of these activities had been conducted for erosion control, other activities had also indirectly contributed to the erosion control.

The "National Action Programme to Combat Desertification", being in force since 2005, renewed in line with the 10-year Strategic Plan of UN Convention to Combat Desertification (UNCCD) within the framework of combating desertification. Relevant institutions and organizations, non-governmental organizations and universities prepared a National Action Plan, updated the National Strategy to Combat Desertification of which preparations were started in 2012 and compiled a document named "National Strategy and Action Plan to Combat Desertification (2015-2023)". A web-based monitoring, evaluation and reporting system has been prepared and implemented to allow the institutions/organizations for the effective online collection and reporting the activities carried out within the context of the action plan.

As a result of the verification and calibration process, it is classified spatial assets of Turkey that 22.5% as highly vulnerable, 50.9% as moderately vulnerable and 18% as low vulnerable to desertification. It detected that middle and south sections of Konya Closed Basin, Sakarya and Kızılırmak Basins, an important section Fırat -Dicle Basin, the section of Thrace Region outside the Black Sea coast and Iğdır-Aralık section of Aras Basin are highly vulnerable to desertification.

When CORINE data of 2012 and 2018 are compared in order to analyze LAND USE and change of lands, it is observed that Agricultural Areas and Forest and Semi-Natural Areas have been reduced by 74,514.53 ha and 97,871.23 ha, respectively. On the other hand, Wetlands, Waterbodies and Artificial Areas have increased by 1,118.24 ha, 30,247.58 ha and 141,019.95, respectively.

1/100,000 Scale Territorial Plans were approved for 19 Planning Areas by the Ministry of Environment and Urbanization between the years of 2005 and 2015. Apart from these, 1/100,000 Scale Territorial Plans were approved for 2 more Planning Areas by the Ministry of Environment and Urbanization and currently, upper scale plans of totally 63 provinces are in force. Furthermore, 1/100,000 Scale Territorial Plans for 17 provinces, of which processes have been conducted by the related institutions, are in effect.

Within the context of the chapter of ORGANIZATIONAL STRUCTURE AND ACTIVITIES OF THE MINISTRY OF ENVIRONMENT AND URBANIZATION, when considered EIA Decisions given by the Ministry of Environment and Urbanization; "EIA positive", "EIA not required" and "EIA required" decisions were given for 440 EIAs, 2,418 EIAs and 71 EIAs, respectively within the By-Law on Environmental Impact Assessment in 2019. And it is observed that "EIA positive", "EIA not required", "EIA negative" and "EIA required" decisions were given for 5,728 EIAs, 63,112 EIAs, 54 EIAs and 1,076 EIAs, respectively between the years of 1993 and 2009.

When considered the number of the certifications given within the By-Law on Environmental Permit License, it is seen that 14,272 Provisional Activity Certificates and 19.951 Environmental Permit and License Certificates were given between the year of 2015 and 2019.

When considered the numbers of Environmental Inspection carried out by the Ministry of Environment and Urbanization, 52,609 and 54,163 auditing were carried out in 2016 and 2019, respectively. And as a result, 108,423,525 TL and 148,034,823 TL administrative fines were imposed in 2016 and 2019, respectively.

In regard to Seveso (BEKRA) Notification System of the Ministry of Environment and Urbanization, there have been totally 814 Seveso Facilities (411 of them high level and 403 of them low level) by July, 2020.

The number of the Environment Officers/Environmental Engineer obtained "Environmental Management Service Qualification Certification" has reached up to 11,964, the number of Environmental Consulting Firms obtained "Environmental Consulting Firms Qualification Certification" has reached up to 652 and

Environmental Management Units obtained "Environmental Management Unit Qualification Certification" has reached up to 301 as of July, 2020.

While the number of laboratories authorized by the Ministry of Environment and Urbanization to carry out measurement and analysis activities within the framework of Environmental Legislation within the scope of By-Law on the Qualification of Environmental Measurement and Analysis Laboratories was 171 in 2016, it has reached 225 laboratories in total, 40 of which are public and 185 private, as of September 2020.

Environment Reference Laboratory operating under the Ministry of Environment and Urbanization, performs analysis of over 1,100 parameters in water, wastewater, sea water, soil, waste, sewage sludge, waste oil, isolation liquid, sediment, flue gas, coal, pomace and fuel oil samples (of which 580 of them are accredited).

Qualification certificates were given to 5 companies within the scope of the procedures and principles regarding the determination of the rules of the Waste Tracking Service Providers. There are a total of 21 institutions / organizations that have received a certificate within the scope of the "Communiqué on Qualification Certificate Regarding the Control of Soil Pollution and Cleaning of Point Source Contaminated Sites". As of July 2020, the applications of a total of 8 institutions / organizations were finalized and the "Certificate of Competence" was given within the scope of the "Communiqué on the Assessment of Risk Assessment and Authorization of Institutions and Organizations to Prepare Emergency Response Plans for Pollution of the Marine Environment by Oil and Other Hazardous Substances".

ENVIRONMENTAL PROTECTION EXPENDITURES increased by 11.6% in 2018 compared to the previous year and reached 38.2 billion TL in total. 56.6% of environmental protection expenditures were made by financial and non-financial companies, 36.3% of those were made by non-profit organizations serving the general government and households and 7.1% of those were made by households.

The environmental protection expenditures were composed of 47.5% waste management services, 35.6% wastewater management services, 6.8% the protection of biological diversity and landscape, 3.6% quality remediation and protection of soil, groundwater and surface waters, and 6.5% environmental protection expenditures on other issues. In addition, its share in the gross domestic product was 1.1% in 2017, and it was 1% in 2018.

Coastal Plants Marine Pollution Compulsory Liability event results from insurance and the coastal resort of Turkey's internal waters, territorial waters, continental shelf and exclusive contamination occurring in the maritime jurisdiction areas consist of economic zones or caused by the threat of pollution clean-up costs, Damages resulting from injury and death of third parties and damage to private property are compensated. The number of policies issued in 2019 regarding the said insurance was 547 and the premium production was 7,207,584 TL.

Cleaning costs caused by the pollution or pollution danger arising from the marine jurisdictions of Turkey consisting of inland waters, territorial waters, continental shelf, and the exclusive economic zone, expenses to be made for the transportation of collected waste, third damages resulting from injuries and deaths of individuals and damage to private property are compensated under Liability Insurance For Marine Pollution By Coastal Facilities. The number of policies issued in 2019 regarding the subject insurance was 547 and the premium production was 7,207,584 TL.

The compensation claims, directed to the policy holder and that he or she would legally have to pay within the context of the environmental legislation due to the sudden and unexpected pollution or pollution danger of the soil, ground waters, inland waters, seas and air - in one, a few or all of them depending on the scope of the contract- are secured with the Environmental Pollution Financial Liability Insurance. The number of policies issued in 2019 regarding the subject insurance was 69 and the premium production was TL 25,666 TL.

STUDIES CONDUCTED FOR THE STATE OF ENVIRONMENTAL REPORTING IN TURKEY

1 STUDIES CONDUCTED FOR THE STATE OF ENVIRONMENTAL REPORTING IN TURKEY

Rapidly increasing population, urbanization, economic activities and diversified consumption habits increase the pressure on the environment and natural resources. Environmental problems such as environmental pollution, climate change, desertification, deforestation, loss of biodiversity and drought have a significant impact on human life and development process day by day. It is observed that climate change, which is accelerated by the effect of high greenhouse gas emissions, causes an increase in natural disasters and poses a serious threat to humanity on a global scale. In these days, when demand and consumption are increasing, building habitable cities with sustainable environment and natural resource management becomes more and more important.

The pandemic crisis experienced on a global scale recently has shown that our quality of life, health, working life, and even the living spaces and future of all living things are completely related to the environment. Nowadays, the way we consume natural resources and our speed has begun to change ecosystems faster than ever before and contrary to nature's ability to renew itself.

Problems such as global warming, climate change, desertification, drought, increase in natural disasters and cross-border transport of pollution, viruses that can spread from destroyed areas and can be transmitted to humans are all signs that our world will become more and more difficult to live if no action is taken. This situation has a risk of destroying our well-being and nature's ability to meet our needs.

In summary, it has become clear that our ecological footprint is beginning to exceed our planet's capacity to regenerate itself. Environmental degradation caused by air and water pollution, noise, radiation, chemicals or biological factors, destruction of natural areas, especially forests, have negative effects on human health. Environmental problems have become rampantly a global element that concerns all people.

A life-cycle approach to resource management has recently come as a guideline, a fundamental principle to reduce our ecological footprint. Efforts in our country, whose ultimate goal is to reach a society with zero waste, have accelerated. A great progress has been made in the internalization of concepts such as "green economy" and "green cities" as a result of the efforts aiming at a zero-waste lifestyle.

In our country, the environmental sector has first been included in the national programs as a part of development plans since the 5th Five-Year Development Plan covering the years 1985-1989. The 11th Development Plan, covering the years 2019-2023, includes the targets and policies for protecting the environment in parallel with increasing the economic and social benefits under the axis of "Livable Cities and Sustainable Environment, improving the quality of life in cities and rural areas and reducing inter-regional development differences

It is emphasized in the 11th Development Plan that while the increasing demand for food, climate change, urbanization, soil and water resources, creates pressure on agricultural products and producers; the

development of plant and animal species suitable for changing climate and protection of environment and biological diversity are becoming more of an issue and the need for qualified workforce and technology is increasing in order to meet the food demand with less resources.

It is seen in the 11th Development Plan that environmental protection and pollution prevention are integrated into other sectors such as development, agriculture, energy, industry, health, transportation, tourism and disaster management. It is aimed to reduce the pressure on the environment and natural resources by integrating the environmental issue into all sectors.

In the plan, it is emphasized that the main objective is to protect the environment and natural resources, to improve their quality, to ensure their effective, integrated and sustainable management, to implement environmental and climate-friendly practices in every field, and to increase environmental awareness and sensitivity of all segments of the society.

Turkey, as a result of integrating the environment into other sectors of sustainable development approach, has been party to many important international environmental agreements and to fulfill their obligations.

With the transition to the Presidential Government System in our country, the organization, duties and powers of the Ministry of Environment and Urbanization were reorganized with the Presidential Decree No. 1 on the Presidential Organization published on 10.07.2018. The clause (h) of Article 104 of the Decree, defining the duties of the General Directorate of Environmental Impact Assessment, Permit and Inspection, includes a provision of "preparing the environmental inventory and the state of the environment reports".

Based on this duty and responsibility; the State of the Environmental Report of Turkey is being prepared quadrennially under the coordination of the Ministry of Environment and Urbanization, General Directorate Of Environmental Impact Assessment, Permit And Inspection, General Directorate of Environmental Inventory and Information Management Department and the SOE Reporting Branch with the participation of departments of the Ministry conducting environment-related activities and relevant institutions and organizations.

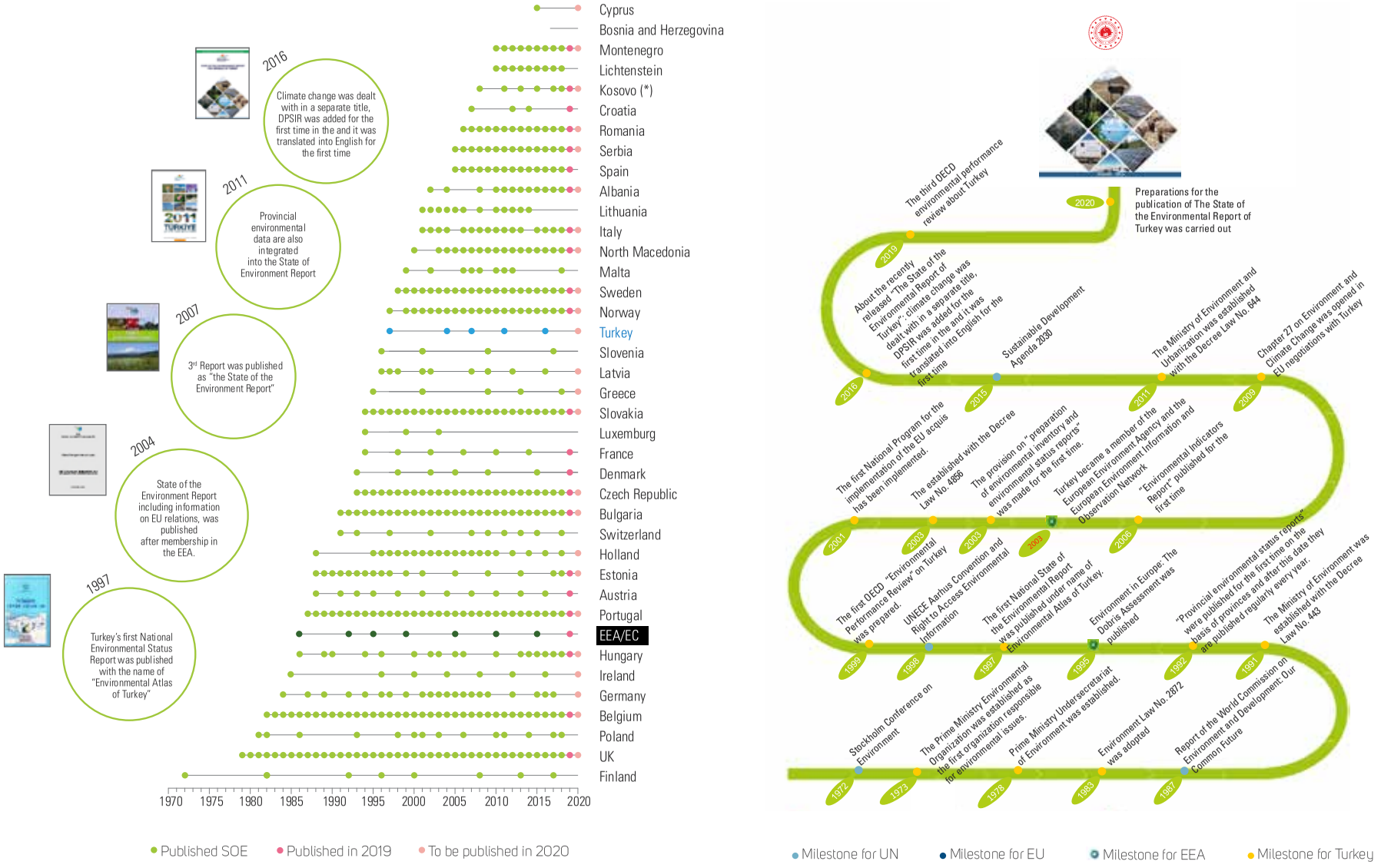
"The State of the Environmental Report of Turkey" prepared by the Ministry of Environment and Urbanization covers the period 2016- 2019. In addition, the report also comprises data and information on 2014 and 2020 relevant to some sectors. The previously published versions of State of the Environmental Reports of Turkey can be accessed through the following link: (https://ced.csb.gov.tr/turkiye-cevre-durum-raporu-i-82673).

"The State of the Environmental Report of Turkey" prepared by the SOE Reporting Branch of the Ministry of Environment and Urbanization within the scope of our country's membership to the European Environment Agency (EEA) has been assigned as the State of the Environmental Reports Primary National Focal Point (NRC-SoE). Necessary active participation and contribution is provided on behalf of our country to the studies conducted within the scope of "State and Outlook Environmental Report in Europe" (SOER) prepared and published by the Agency every 5 years. An infographic (Figure-1) summarizing the process of Environmental Status Reports in our country was prepared and presented within the scope of the country contribution to SOER: 2020 Report published by the EEA.

One of main indicators that reveal whether the objectives highlighted in the 11th Development Plan are achieved is the State of the Environment Report of Turkey. the State of the Environmental Reports, prepared and published quadrennially, reveals the current state of the environment by providing an overall perspective on the period to which it belongs and has the characteristics of being a source in terms of ensuring comparison of the periods before and after itself. It constitutes one of the main tools in increasing environmental awareness and sensitivity of all segments of society. It provides the opportunity to determine whether the targets, policies and strategies set in the field of environment have been achieved. For this reason, environmental status reports are the most effective source of information that can guide the future environmental and climate change policies.

Figure 1 – State of the Environment Reporting in Turkey

State of the Environment Reporting in Turkey and EEA Member States



(*) As required by UN Security Council Resolution 1244/99

Source: European Environmental Agency
https://www.eea.europa.eu/themes/sustainability-transitions/state-of-the-environment-reporting/turkey-state-of-the-environment-reporting/view

GENERAL OVERVIEW OF TURKEY

GENERAL OVERVIEW OF TURKEY

1. Geography

Turkey's territory is located between 36-42° North latitudes and between 26-45° East longitudes. There is a 76-minute time difference between its easternmost and westernmost tips. It roughly resembles a rectangle and has a width of 1.660 kilometers. The actual area it covers, including lakes and islands, is 814,578 km² and the projected area is 779,578 km². Turkey's land border length is 2,875 km and its coast line, including islands, is 8,333 kilometers in length.

Turkey's neighbors are; Bulgaria and Greece in the west, Georgia, Armenia, Azerbaijan and Iran in the east, Iraq and Syria in the South. Three sides of Turkey are surrounded with the Black Sea, the Mediterranean Sea and the Aegean Sea and has an inland sea named the Sea of Marmara.

Map 1 – Geographic Regions of Turkey

Turkey's main geographical regions are Mediterranean Region, Eastern Anatolia Region, Aegean Region, Southeastern Anatolia Region, Central Anatolia Region, Black Sea Region and the Marmara Region. The areas of the regions according to their projected areas are given below:

Eastern Anatolia Region	171,000 km^2
Central Anatolia Region	162,000 km^2
Black Sea Region	146,000 km^2
Mediterranean Region	122,000 km^2
Aegean Region	85,000 km^2
Marmara Region	67,000 km^2
Southeastern Anatolia Region	27,000 km^2

More than half of Turkey is composed of high-elevation areas in excess of 1,000 meters. Nearly one in three of these areas are medium-altitude plains, plateaus and mountains and 10 percent of those are covered with low-lying areas. The highest and mountainous areas are located in the eastern part. North Anatolian Mountains rough the northern part and the Taurus Mountains rough the south, east and southeast parts. While the highest point of our country is the peak of Mount Ararat reaching 5,166 meters, the main wide plains are Çukurova, Konya Plain and Harran Plains.

Mountains of Turkey: Mount Ararat (5,137 m), Mount Buzul (Cilo) (4,116 m), Mount Judi (5,000 m), Mount Suphan (4,058 m), Mount Kaçkar (3,932 m), Mount Erciyes (3,917 m), Uludağ (2,543 m).

Rivers of Turkey: The longest river, whose source and pours into the sea is within the borders of the country, is Kızılırmak with a length of 1,355 kilometers. Other rivers are Yeşilırmak (519 km), Sakarya (824 km), Fırat (2,800 km), Dicle (1,900 km), Büyük Menderes (584 km), Seyhan (560 km), Ceyhan (509 km), Meriç (590 km), Küçük Menderes (450 km), Göksu and Çoruh.

Natural Lakes: The biggest natural lake in Turkey is Lake Van with a surface area of 3,713 km². And the biggest artificial lake is Atatürk Dam Lake with a surface area of 817 km². Other lakes are Salt Lake 1,500 km², Lake Beyşehir 656 km², Lake Eğridir 468 km², Lake Akşehir 353 km², Lake İznik 298 km², Lake Burdur, Lake Salda, Lake Eymir.

Islands: The biggest island is Gökçeada with a surface area of 279 km². Other major islands are: Balıkesir Marmara Island 117 km², Bozcaada 36 km², Uzunada 25 km², Balıkesir Alibey Island 23 km², Balıkesir Paşalimanı Island 21 km², Balıkesir Avşa Island 21 km².

2. Climate

Turkey is located between temperate and semi-tropical zones. As a result of being surrounded by sea on three sides and the strike of its mountains the diversity of landforms, Turkey enjoys different types of climate in different regions. more temperate maritime climate is seen in the coastal regions of Turkey with the impact of seas. The North Anatolian Mountains and the Taurus Mountains prevent the effects of the sea from entering the inner parts. Thus, continental climate dominates the interior regions. Therefore, continental climate in the interior of Turkey is seen. Based on the criteria used in the world-wide climate classifications, the following climate types can be distinguished in our country.

1. Semi-Arid - Steppe Climate
2. Subtropical Humid Climate
3. Subtropical Dry Summer Climate, Mediterranean Climate
4. Terrestrial Temperate Climate
5. Marine Temperate Climate

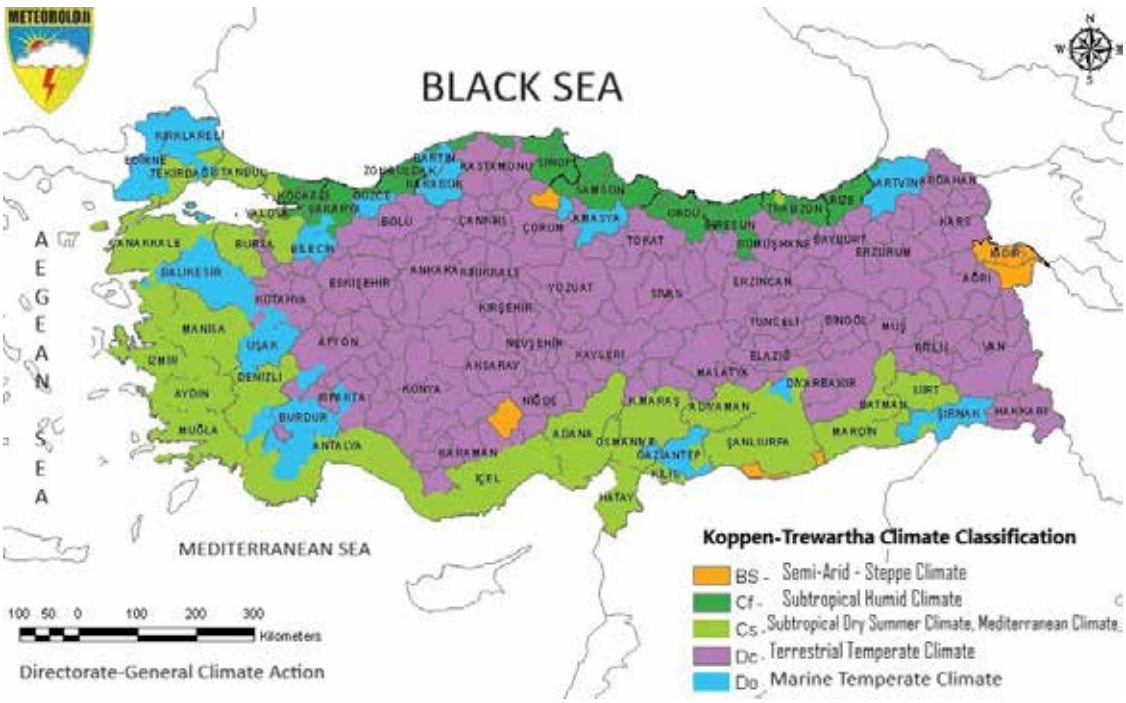
According to the Koppen-Trewartha climate classification, Turkey shows the main classes of climate. Accordingly, most of the country, especially the area that covers the Central and Eastern Anatolia regions, is defined as continental temperate climate, while the Aegean, Mediterranean and Southeastern Anatolia regions show subtropical dry summer climate characteristics. While subtropical humid climate prevails in the Black Sea coastal areas, some provinces in Thrace and the Inner Aegean show marine temperate climate characteristics. Semi-arid steppe climates are observed in Iğdır province, Konya-Ereğli, Urfa-Ceylanpınar and Çorum Osmancık (Map 2).

Atalay, İ., (1997), Ali defined the following climate types for our country, based on the criteria used in the world-wide climate classifications (Map 3);

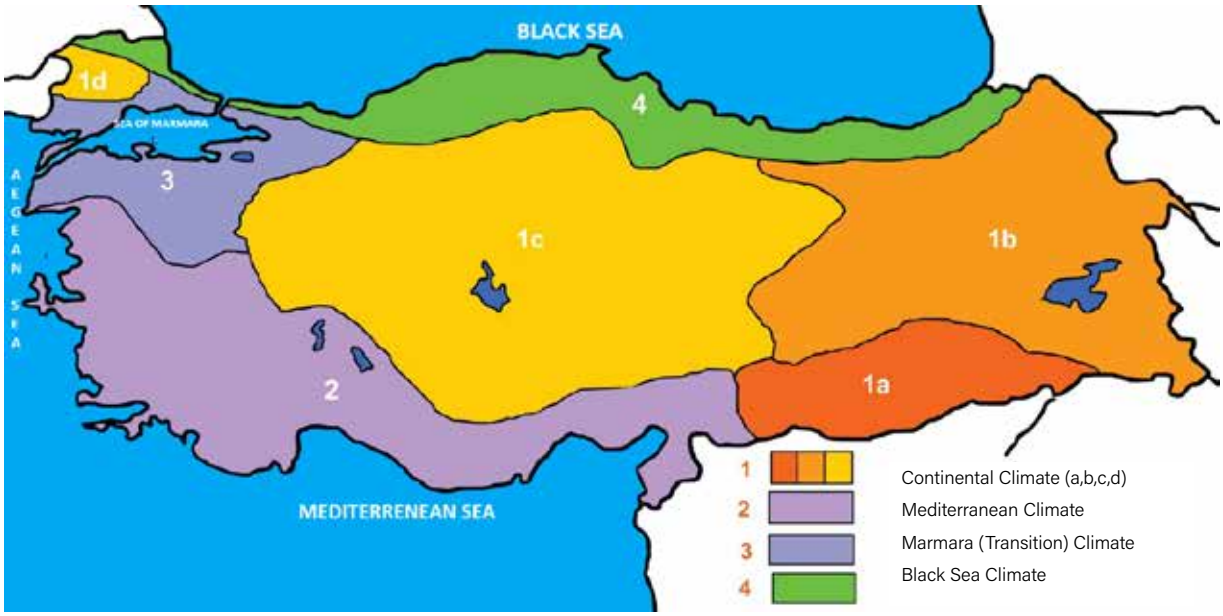
1. Continental Climate (a, b, c, d)
2. Black Sea Climate
3. Mediterranean Climate
4. Marmara (Transition) Climate

Map 2 - Turkey's Climate According to Koppen-Trewartha Climate Classification (General Directorate of Meteorology, 2020)

Turkey's Climate According to Koppen-Trewartha Climate Classification



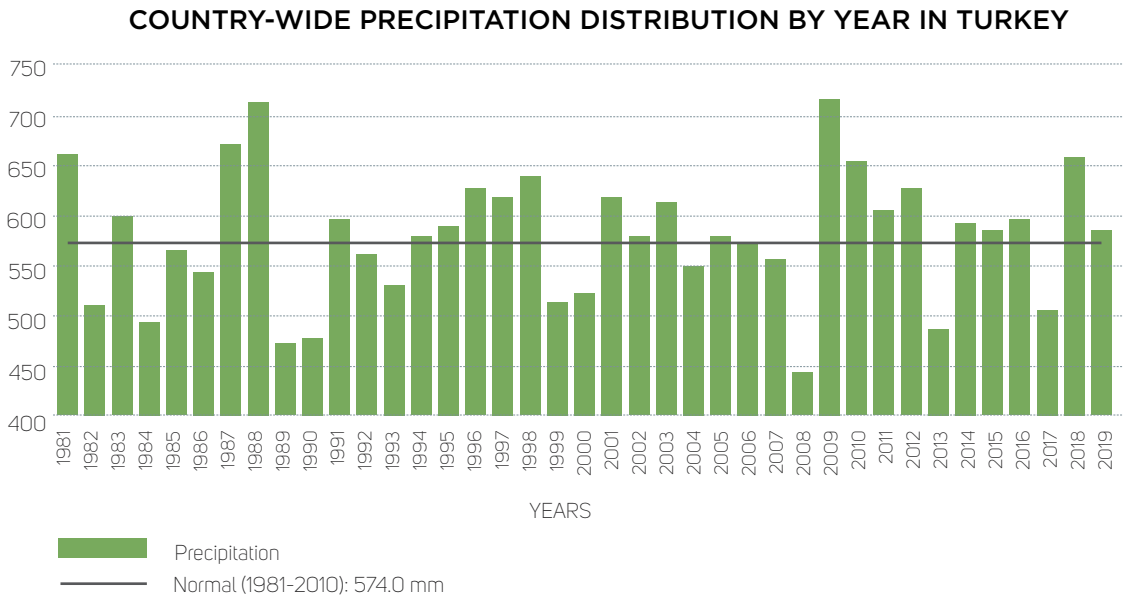
Map 3 –Present climatic zones (types) in Turkey
(Atalay, İ., 1997)



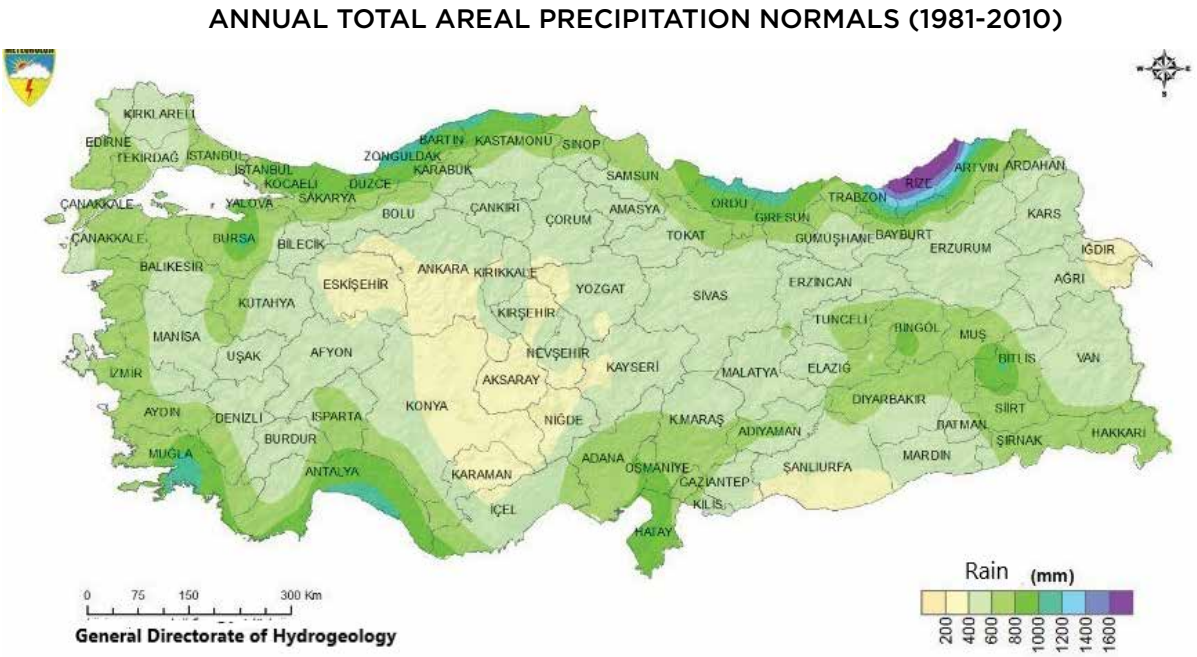
Precipitation Distribution over Turkey

Although the annual areal precipitation of Turkey is 574 mm (1981-2010), the rainfall pattern varies by region, month, season and years (Graph 1). Annual areal total precipitation varies between 200-1,600 mm according to different regions. The most rainfall in the country is in the winter season. Annual areal precipitation averages are 696 mm in the Black Sea, 666 mm in the Mediterranean, 592 mm in the Aegean, 662 mm in the Marmara, 558 mm in Eastern Anatolia, 532 mm in Southeastern Anatolia and 406 mm in Central Anatolia. (Map 4).

Graph 1 - Country-wide Precipitation Distribution by Year over Turkey
(General Directorate of Meteorology, 2020)



Map 4 - Areal Distribution of Annual Total Precipitation over Turkey (1981-2010) (General Directorate of Meteorology, 2020)



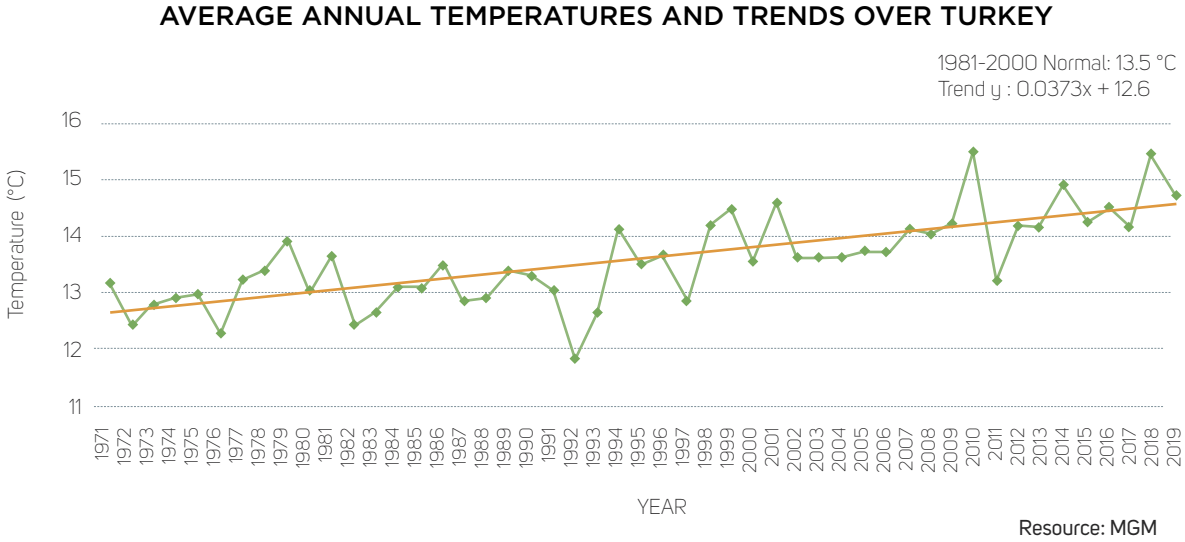
Temperature Distribution over Turkey

When Turkey's average temperature distribution according to the 1981-2010 climate normals are analyzed, its seen that the highest average temperature in the Mediterranean and the lowest average temperature is in the Northeast (Map 5). When the temperature changes between 1970 and 2019 are examined, there have been temperature increases since 1993, with the exception of 1997 and 2011 (Graphs 2 and 3). 2010 has been the warmest year of Turkey. The average temperature, which was 13.2°C between the years of 1971-2000, rose to 13.5 ° C between the years of 1981-2010 (MGM, 2019).

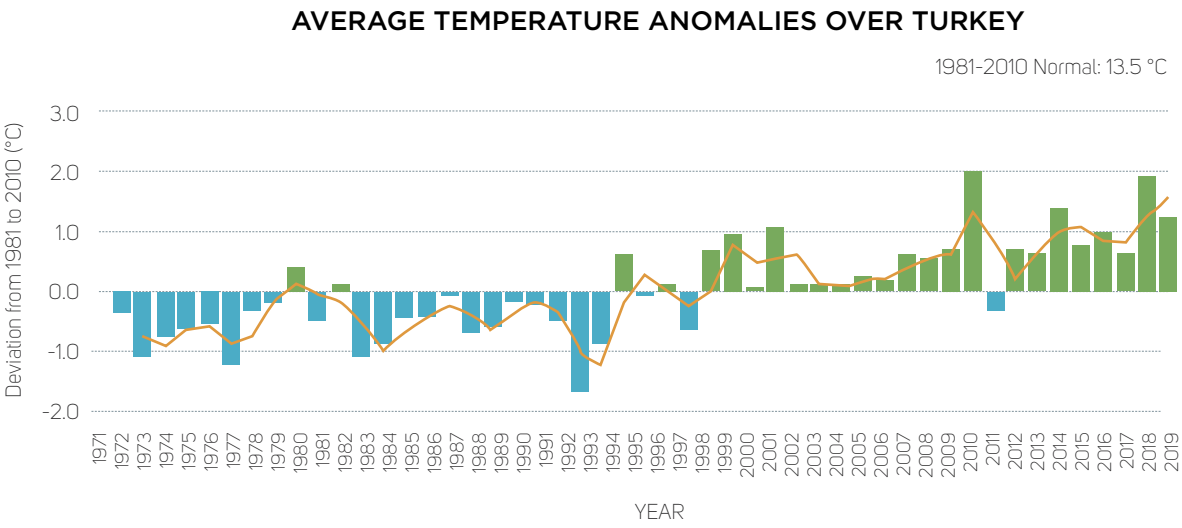
Due to Anatolian topography, the differences between the temperatures of different regions in summer are not very large. However, there are larger differences between regions in terms of winter temperatures. Large differences are also observed between regions and provinces in the same region in terms of temperature average and extreme values. The years when low winter temperatures fall below -20 ° C in Central Anatolia and below -30 ° C in Eastern Anatolia are very common. The Southeastern Anatolia Region, where winters are generally mild, is the region with the highest values (around 35–40 ° C) in terms of summer temperatures.

Map 5 - Areal Distribution of Annual Average Temperature over Turkey
(General Directorate of Meteorology, 2020)

Graph 2 - Annual Value Graph of Average Temperatures Over Turkey
(General Directorate of Meteorology, 2020)



Graph 3 - Average Annual Temperature Anomalies Graph of Turkey (1981-2010)
(General Directorate of Meteorology, 2020)



3. Population

Population growth is the most important driving force that forms the basis of human activities and that puts pressure on the environment. Population growth and population growth rate are one of the basic indicators of "Environmental Performance Measurement" and "Environmental Sustainability Index" studies in the international arena.

Table 1 – Population of Turkey
(TURKSTAT, 2020)

	2016	2017	2018	2019
MALE	40,043,650	40,535,135	41,139,980	41,721,136
FEMALE	39,771,221	40,275,390	40,863,902	41,433,861
TOTAL	79,814,871	80,810,525	82,003,882	83,154,997

Economic factors lie at the root of the relationship between population and environment. As in all countries, economic, social, cultural, geographic, demographic and political reasons are among the main reasons of internal migration in our country.

Although Turkey's population has increased continuously since 1990s, there is a decrease in the population growth rate. As can be seen in Table 2, there is an annual average population growth rate of 1.36% in the 2015-2019 period.

Table 2 – Population Growth Rate in Turkey
(TURKSTAT, 2020)

YEARS	2015-2016	2016-2017	2017-2018	2018-2019
POPULATION GROWTH RATE (%)	1.35	1.24	1.47	1.39

Table 3 - Number of population in the Cities (City / Town Centers) and Villages (District / Villages) of Turkey
(TURKSTAT, 2020)

	CITY	VILLAGE
2015	72,523,134	6,217,919
2016	73,671,748	6,143,123
2017	74,761,132	6,049,393
2018	75,666,497	6,337,385
2019	77,151,280	6,003,717

4. Natural Resources

4.1. Petroleum

Considering the available energy resources in the world in terms of proved reserves and annual production amounts, it is seen that the reserve life is limited and it was calculated as 50.2 years as of the end of 2017. Petroleum, which is the most basic energy source in the world, has met 33.3% of the global energy need as of 2017.

Approximately 57% of the world's producible oil and natural gas reserves are located in the Eurasia and Middle-East regions, which are geographically close to our country. Owing to its geopolitical location; Turkey, as a neighbor of the countries in the region with three-quarters of oil and natural gas reserves, takes part in many important projects and provide support to those by acting as an "Energy Corridor" between energy rich Caspian, Middle Eastern and Central Asian countries and consumer markets in Europe. It is predicted that a significant portion of the world's primary energy demand, which is expected to have increased by 40% by 2030, will be met from the resources of the region we are a part of.

As of the end of April 2020, 39 oil wells with a total length of 99,206 meters were drilled, including 16 exploration wells, 6 detection wells and 17 production wells. In addition, crude oil was produced from 1,454 production wells in 169 production sites in 2019. In 2019, 20.8 million barrels of crude oil was produced domestically and 12.9 million barrels of crude oil was produced abroad.

With the rapid growth of the economy and industry, our country's demand for petroleum products is constantly increasing. While 3.0 million tons of crude oil was produced in 2019, 31.07 million tons of crude oil was imported. In the same period, 13.74 million tons of petroleum products were imported, while 14.28 million tons of petroleum products were exported.

4.2. Natural Gas

In 2019, TPAO (the Turkish Petroleum Corporation) produced a total of 404.67 million sm^3 of natural gas from natural gas fields. 99% of this production was obtained from Thrace and 1% from the Southeastern Anatolia Region. The crude oil equivalent of natural gas produced is 2.4 million barrels. Natural gas demand may change seasonally, reaching the highest level in winter with the increase in housing demand. In order to make the natural gas supply security more effective and sustainable in our country, natural gas storage capacity has been increased in the last 4 years.

Table 4 – Underground Natural Gas Storage and Withdrawal Capacity (BOTAŞ, 2020)

Year	Natural Gas Storage Capacity, billion Sm^3	Withdrawal Capacity, million m^3/day
2015	2.66	20
2016	2.84	25
2017	3.19	40
2018	3.44	45
2019	3.44	45

Table 5 - Domestic Natural Gas Sales Amount (%*) (BOTAŞ, 2020)

Year	Electricity	Housing	Industry	Total Sale
2015	44.8	26.2	26	3
2016	42.3	30.2	24.5	3
2017	45	28.6	24.1	2.3
2018	35.1	34.5	30.4	0
2019	24.1	41.1	32	2.8

*Shows the percentage of domestic sales realized by BOTAŞ, but does not indicate percentages of national consumption.

4.3. Coal

Coal is the most common of the fuels used for electricity generation. It is estimated that the nature of coal as the fuel used at the highest rate in electricity generation will not change in the foreseeable future. Lignite is a type of coal that is generally used as fuel in thermal power plants due to its low calorific value, high ash and moisture content. However, it is an energy raw material that is frequently used as it is found in large quantities in the earth's crust. Hard coal is in the group of high-calorie coals.

The lignite reserve was 15.5 billion tons by the end of 2015 and increased up to 19.32 billion tons by the end of 2019 as a result of the information shared between the relevant public institutions and new additional drillings performed in accordance with the project initiated the Ministry of Energy and Natural Resources in line with the policies of using domestic resources and reducing foreign dependency. In addition, there are 2.1 billion tons of hard coal reserves in our country.

Turkey, in terms reserves and production amounts, can be assumed as moderate level in lignite and low level in hard coal on a global scale. Approximately 1.6% of the total world lignite reserves are in our country.

Table 6 - Raw Coal Production Amounts for 2015-2018 (Ton) (MAPEG, 2020)

Year	Hard Coal	Lignite	Total
2015	2,074,049,00	58,730,170,00	60,804,219,00
2016	1,881,664,00	77,896,048,00	79,777,712,00
2017	1,764,028,00	84,303,492,00	86,067,520,00
2018	1,620,682,00	99,017,695,00	100,638,377,00

Lignite fields are spread across all of Turkey and lignite coal heating values of this field range between 1000 and 5000 kcal / kg. Majority of the coal in Turkey is consumed in the industrial sector (cement factories, sugar mills and other industrial plants) and coking plants (iron and steel plants). Hard coal is consumed mostly in industry sector (cement plants, sugar factories and other industrial facilities) and in Turkey.

While hard coal production has decreased in our country since 2015, a regular increase has been achieved as a result of the incentives applied in lignite production. After all of the produced raw coals are passed through the screening-sorting / launder facilities, they are presented to consumption as salable coals with improved quality.

In its lignite production and coal explorations; the General Directorate of Turkish Coal Enterprises attaches importance to advanced coal production, coal preparation and other clean coal technologies in order to ensure environmental friendly consumption of coal and increase the quality of coal by adopting economy, efficiency and innovativeness principles in concordance with environmental legislations and policies of harmonization with EU, by considering changing and developing conditions of today's world. In line with this, it has been conducting research and development projects in cooperation with various universities and institutions.

4.4. Geothermal

Geothermal energy is the energy obtained by transporting the heat accumulated in the depths of the earth's crust to the surface in liquid and vapor phase. Turkey is the 1st in Europe in terms of geothermal potential and 4th in the world in terms of installed capacity. Top five countries in electricity generation from geothermal energy are US, Indonesia, the Philippines, Turkey and New Zealand.

Turkey, due to the geological structure, is a rich country in terms of geothermal resources. Low temperature (20-70 ° C) areas are directly utilized as heat energy. Main areas where heat energy is directly used are greenhouses, thermal hotels and hot springs, tourism sector, food industry applications on fruit and vegetable drying, urban heating. Medium temperature (70-150 ° C) and high temperature (higher than 150 ° C) fields can be used in electricity generation as well as in integrated heating-electricity generation applications depending on re-injection conditions.

The total theoretical sensible geothermal heat potential of Turkey is 35,500 MWt; the total theoretical geothermal electricity potential is 4,500 MWe (26,250 GWh), the total economic electricity potential is 2,000 MWe (12,000 GWh). As of the end of August 2020, our country's geothermal installed power is at the level of 1.515 MW. It is estimated that the theoretical potential for direct use of heat energy is 7.5 million housings equivalent and the economic potential is 1 million housings equivalent heat energy. Currently, ~ 140,000 housings equivalent heat energy (~ 1,205 MWt) is obtained with geothermal central heating systems and 46,400 housings equivalent heat energy is obtained from thermal springs, thermal hotels and timeshare facilities.

4.5. Solar

Turkey has a very high potential for solar energy and average annual global radiation value is at a level of 1635 kWh / m2. This value is higher than many European countries for solar power generation and is at the level of countries such as Spain and Italy.

Our total installed capacity of Solar Power Plant (SPP), which was 40 MW in 2014, reached 5,995 MW at the end of 2019. As of the end of 2019, 6.57% of the total installed power belonged to SPPs. As of 2018, the total installed solar collector area in our country was calculated as approximately 20,200,000 m². In 2018, approximately 876,72 TEP (Tones Equivalent Petroleum) heat energy was produced by

solar collectors. In 2018, the amount of heat energy used in residential buildings was calculated as 569,868 TEP, and the amount used for industrial purposes was 306,852 TEP.

According to the National Energy and Mining Policy announced in 2017, it is aimed to increase the installed power of SPP by 10 GW between 2017-2027. According to the 11th Development Plan published in the Official Gazette No. 30840 dated 23/07/2019 and numbered 30840, the share of renewable energy sources in electricity generation is targeted to be 38.8% in 2023. According to the 2019-2023 Strategic Plan of MENR, the installed power of GES is targeted to be 10 GW in 2023. There is one facility that manufactures solar cells. In addition to these, there are more than 10 solar module production factories.

With the President's Decree dated 09/05/2019 and numbered 1044, the upper limit of installed power of generation facilities based on renewable energy sources that can perform unlicensed generation activities has been increased from 1 MW to 5 MW by those who are entitled to receive a letter of invitation to the connection agreement as of 10/05/2019. As a result of the by-laws made with the said decree, it is expected that the number of applications for solar power plants built on the roof will increase. Within the scope of this decision, while there were 2,429 SPP applications with a total installed power of 670 MW by industry subscribers before May 10, 2019, after the decision, 1,207 SPP applications with 862 MW installed power were received. While 1,090 SPP applications with a total installed power of 10 MW were made by residential subscribers before 10 May 2019, 1,218 SPP applications with an installed power of 11,76 MW were made after the decision. There are 5,944 roof applications with a total installed power of 1,554 MW. As of the end of 2019, the total installed power of the rooftop SPP is 252 MW.

The first application within the scope of the "By-Law on Renewable Energy Resource Areas" published in the Official Gazette dated 09.10.2016 and numbered 29852 was carried out in Konya / Karapınar in 2017 based on solar energy. A total area of 27.19 km^2 in Karapınar was determined as Renewable Energy Resource Area (RERA). A solar energy-based electrical energy production facility with a capacity of 1,000 MWe will be built on 19,19 km^2 part of this area.

The largest and first integrated Solar Module Manufacturing Factory of Turkey and the region was established in Capital Organized Industrial Zone (OIZ). Turkey's first and only silicon ingot, wafer and solar cell production is carried along in the factory and photovoltaic (PV) solar module production capacity is 510 MWp / year. The total domestic contribution rate of PV solar modules produced in an integrated manner in the factory has been determined as 76.42%. R&D activities are carried out on 5 different focuses in the R&D Center established for PV technologies at the same location with the factory. PV solar modules produced in the factory have started to be used in the Karapınar RERA-1 SPP which will be established as the total installed power will be 1000 MWe / 1300 MWp. With the commissioning of the entire facility, 2.2 billion kWh of electricity can be produced annually.

In addition, 74 different competition announcements, each 10 MWe, 15 MWe and 20 MWe, were published in the Official Gazette on 3 July 2020 for the allocation of RERA connection capacities of 1000 (thousand) MWe based on solar energy resources in 36 provinces and the applications will be made on 19-23 October 2020.

4.6. Wind

It is predicted that a wind power plant with power of 5 MW per square kilometer will be established in areas 50 meters above ground level and with wind speeds above 7.5 m / s in Turkey. In the light of these assumptions, according to the Wind Energy Potential Atlas (WPPM), in which wind resource information produced using medium-scale digital weather forecast model and micro-scale wind flow model is given, the wind energy potential of our country was determined as approximately 48,000 MW (37 GW terrestrial and 11 GW offshore). The total area corresponding to the potential is equal to 1.30% of Turkey's surface.

According to the National Energy and Mining Policy announced in 2017, it is aimed to increase the installed power of WPS by 10 GW in 10 years until 2027. According to the 11th Development Plan, it is aimed that the share of renewable energy sources in electricity generation will be 38.8% and our total installed power will be 109 GW in 2023. According to the MENR 2019-2023 Strategic Plan, the installed wind power is aimed to be 11,883 MW by the end of 2023.

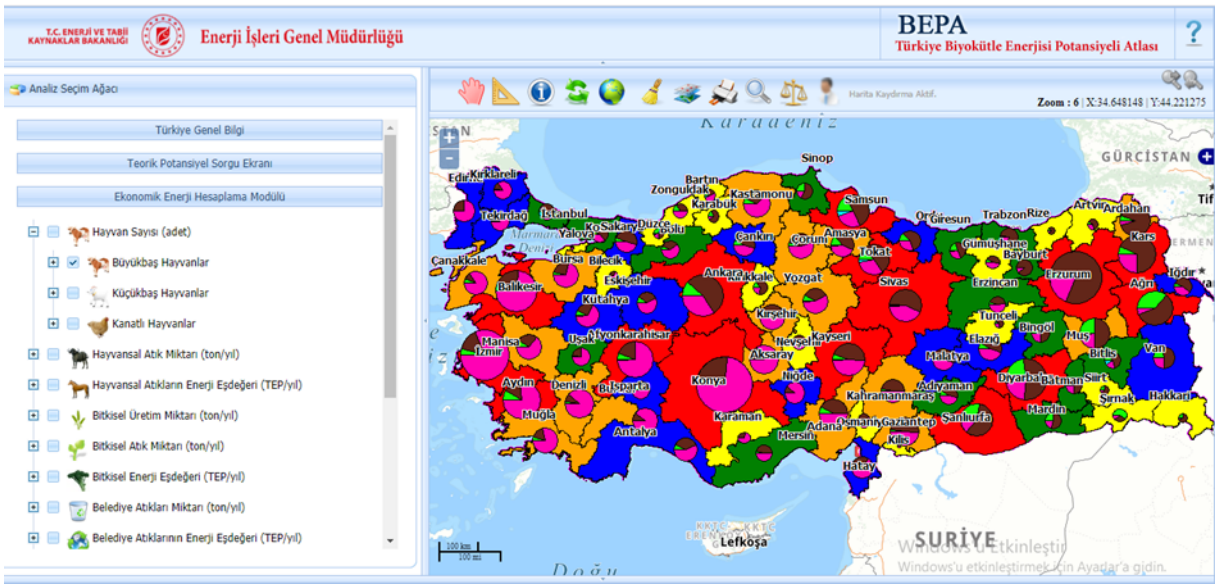
RERA WPS-1 and RERA WPS -2 competitions were held in 2017 and 2019 for the allocation of wind energy connection capacities. Within the scope of RERA WPS -1 competition; the establishment of the factory, which has a minimum production capacity of 104 wind turbines per year, has been completed, and wind turbines will be produced at the factory with a at least total 65% indigenousness rate. The turbines to be produced in this factory will be installed in 6 WPPs with a total installed power of 1000 MWe. Within the scope of RERA WPS -2 competitions; competitions were held on 30.05.2019 for 4 different connection regions (Muğla, Aydın, Balıkesir and Çanakkale), each with a total connection capacity of 250 MWe, and the processes of determining RERAs continues with the winner companies.

4.7. Biomass

Biomass is considered to be the total mass based on living organisms. Our country offers various alternatives in terms of biomass resources. The database has been created for biomass resources in our country by means of the Biomass Energy Potential Atlas (BEPA) of Turkey prepared by the Ministry of Energy and Natural Resources (MENR). Access is available to BEPA from the website of MENR via **https://bepa.enerji.gov.tr.** The installed power of biomass (including waste heat) -based electrical energy reached 1,163 MW and 4,624 GWh of biomass-sourced electricity was produced as of the end of 2019.

In addition to analyzing different biomass resources in different provinces and districts, data are also provided for technology selection according to biomass source in energy production by means of BEPA. The information of biofuel production facilities as well as that of licensed-unlicensed facilities that produce electricity using biomass source are also included in the BEPA application.

Map 6 - Biomass Energy Potential Atlas (BEPA) of Turkey
(the Ministry of Energy and Natural Resources, 2020)



4.8. Mines

With regard to diversity and reserves of mines, Turkey ranks the 28th among the 132 countries dealing with mining in terms of total amount of mine production and ranks as 10th in terms of diversity of mine production.

Turkey, in addition to boron and lignite, has remarkable mineral reserves minerals such as marble, trona, barite, chrome and magnesite. However; It is far from being self-sufficient especially in the field of energy raw materials, especially in oil, natural gas and hard coal. In addition, the fact that most of the existing iron ores are of low grade and therefore cannot be utilized increases the foreign dependency in terms of such mines.

Table 7 - Amount of some mine reserves in Turkey (Ministry of Energy and Natural Resources) (2015-2019) (MTA, 2020)

Mine	Reserve (ton)	Grade
Chrome	42,877,559	4.5%-10.9 Cr_2O_3
Bentonite	923,169,110	Bleaching value: Classified as available, well and very well.
Copper	1,218,305,327	0.12%-1.63%
Iron	537,829,915	8-51%
Zinc	535,516,822	0.36%-21%
Coal	7,724,273,613	
Feldspath	1,413,047,297	3.52%-10.58 Na_2O+K_2O
Kaolin	306,000	20% Al_2O_3
Clay	13,601,402	
Aluminium	25,235,894	18-33% Al_2O_3
Nickel	40,036,000	0.15% - 1,91% Ni_2O_3
Trona	15,000,000	97% Na_2CO_3
Trona/ Thenardite	2,311,845,631	68.1% Ort NaCl

73% of the world boron reserves, 23% of the world feldspar reserves and 20% of the bentonite reserves are in our country. Our country has an important place in soda production, especially the facility established to operate the Beypazarı Trona deposit, which is the second largest soda ash reserve in the world.

Table 8 - Soda-Trona Production
(MAPEG, 2020)

Year	Production (ton)
2015	1,854,290
2016	1,976,880
2017	3,274,416
2018	12,419,013

Marble types in up to 650 colors and textures have been identified in the researches conducted in our country. According to current data, 40% of the world's marble reserves (approximately 5-6 billion m^3 marble) are reserved in our country.

Table 9 - Natural Stone Productions (Ignimbrite, Marble, Travertine and Onyx Productions) (MAPEG, 2020)

Year	Production (ton)
2015	18,619,978
2016	17,362,002
2017	16,811,545

4.8.1. Gold and Silver Mining

Table 10 - Resource Amounts of Gold and Silver Fields that MTA Received Discovery (MTA, 2020)

Gold Resource Amounts for 2015-2019		
Year	**Resource (ton)**	**Grade**
2015	-	-
2016	1,324,352	0.62 gr/ton Au
2017	-	-
2018	7,491,598	0.85 gr/ton Au
2019	825,306,901	0.26 gr/ton Au

Silver Resource Amounts for 2015-2019		
Year	**Resource (ton)**	**Grade**
2015	-	-
2016	-	-
2017	-	-
2018	-	-
2019	268,955,414	14.94 gr/ton Ag

4.9. Forest Wealth

Almost all of the forests of our country are under the rule and disposition of the state and are managed by the General Directorate of Forestry on the basis of sustainability. In accordance with Article 26 of the Forestry Law No. 6831, all of the country's forests are operated in line with forest management plans. With regard to the results of the forest inventory assessment conducted on the sizes and changes of forest areas so far; the size of the general forest area was 20.2 million hectares (26.1%) in the first inventory period (1963-1972) and 22.7 million hectares (29.2%) in the last inventory year (2019). According to the results of this inventory, it is seen that there has been an increase of approximately 2.5 million hectares in the forest area in the last 47 years.

Table 11 - Distribution of Forest Areas, 1946-2019
(General Directorate of Forestry, 2020)

	1963-1972	2004	2015	2019
Forest Type	20,199,296	21,188,747	22,342,935	22,740,297
High forest (hectares)	10,934,607	15,439,595	19,619,718	21,540,131
Marsh (hectares)	9,264,689	5,749,152	2,723,217	1,200,166

The total wealth of the forest was determined to be 935.5 million m^3 in the first inventory period and 1.7 billion m^3 in the last inventory period and the tree wealth of the country's forests increased by approximately 0.8 billion m^3 between 1973 and 2019.

Table 12 - Forest Stock of Turkey (planted barked trunk volume)
(General Directorate of Forestry, 2020)

	High Forest	Coppice Forest	Total
Quality	m^3	m^3	m^3
Normal	1,595,828,101	14,013,759	1,609,841,860
Degraded	64,790,641	4,723,709	69,514,350
TOTAL	**1,660,618,742**	**18,737,468**	**1,679,356,210**

The Ministry of Agriculture and Forestry has worked on an area of 5 million 402 thousand hectares in the last 17 years, and approximately 4 billion 637 million saplings have been underplanted. Most of these saplings have been used in forestry establishment works devoted to the development and expansion of forests (afforestation, combating erosion, improvement of degraded forest areas, private afforestation and artificial tensile), and some of them have been used in the afforestation of road / village road, school / hospital / temple / university garden and cemetery (tall saplings). 7 billion saplings are aimed to have been underplanted by 2023.

Table 13 – Activities Carried Out by the General Directorate of Forestry and the Amount of Work Area
(General Directorate of Forestry, 2020)

ACTIVITIES	YEARS	WORK AREA (hecrates)
Afforestation	1946-2019	2,447,893
Erosion Control	1962-2019	1,550,774
Avalanche Control	2013-2019	900
Flood Control	2019	1,250
Rehabilitation	1998-2019	2,899,514+ afforestation rehabilitation
Pasture Improvement	1962-2019	258,531
Private Afforestation	1986-2019	141,319
Artificial Rejuvenation	1973-2019	865,544
Energy Forest Establishment	1978-2005	623,247

By the end of 2019, the Ministry of Agriculture and Forestry carried out afforestation, erosion control, improvement of degraded forests, in-forest pasture improvement, artificial regeneration and energy forest establishment works on 9 million 87 thousand hectares of area. 1 million 551 thousand hectares of these works were for combatting erosion (prevention) efforts.

4.10. Pastures, Grasslands, Grazing Lands, Summer Pastures, Winter Pastures

Pastures, summer pastures and winter pastures are our natural resources that are of great importance for the development of animal husbandry, prevention of erosion and development of basins. With the Pasture Law, the Ministry of Agriculture and Forestry aims to identify and restrict pastures, summer pastures and winter pastures, to allocate them to village or municipal legal entities, to use them in accordance with the rules to be determined, to increase their efficiency by making maintenance and rehabilitation, to control and protect their use.

12,002,335 hectares of determination, 8,258,011 hectares of restriction and 5,035,091 hectares of allocation works have been carried out within this context so far. In addition, rehabilitation works have been carried out in 10,510,691 decares, for which identification and restraint work was completed.

Table 14 - Determination, Restriction and Allocation Amounts Made Within the Scope of the Pasture Law by Years
(The Ministry of Agriculture and Forestry, 2020)

YEARS	Determination (ha)	Restriction (ha)	Restriction (ha)
1999	97,788	73,481	
2000	386,597	284,860	38,020
2001	634,482	460,644	75,706
2002	1,064,208	846,247	128,520
2003	1,428,221	249,229	135,271
2004	810,286	402,500	57,188
2005	690,026	244,673	85,417
2006	884,877	312,681	80,423
2007	1,056,656	453,955	82,513
2008	530,000	233,872	55,629
2009	619,562	253,042	69,177
2010	306,028	299,716	574,898
2011	205,621	211,471	662,679
2012	771,184	816,499	786,033
2013	659,950	617,519	483,989
2014	202,683	222,712	345,172
2015	414,637	288,368	64,280
2016	135,638	333,192	141,356
2017	86,122	208,110	232,633
2018	75,100	810,959	654,722
2019	942,669	634,281	281,465
TOTAL	12,002,335	8,258,011	5,035,091

Table 15 - Pastures in Turkey in 2020, by regions
(The Ministry of Agriculture and Forestry, 2020)

(1998-2019)			
REGION	Total Determination (ha)	Total Restriction (ha)	Total Allocation (ha)
MEDITERRANEAN	557,831	411,399	261,364
EASTERN ANATOLIA	4,406,412	2,549,951	1,650,159
AEGEAN	278,451	302,991	100,073
SOUTH-EASTERN	791,782	487,178	182,603
CENTRAL ANATOLIA	4,398,273	3,184,808	2,389,682
BLACK SEA	1,285,473	1,053,921	236,178
MARMARA	284,113	267,763	215,031
TOTAL	12,002,335	8,258,011	5,035,091

Table 16 - Pastures in Turkey between 1998-2020, by province
(The Ministry of Agriculture and Forestry, 2020)

(1998-2019)					
Province-Code	Province	Pastures (TURKSTAT)	Total Determination (ha)	Total Restriction (ha)	Total Allocation (ha)
01	ADANA	49,837	47,758	44,893	34,630
02	ADIYAMAN	87,990	48,146	44,448	44,199
03	AFYON	331,766	82,661	138,899	42,745
04	AĞRI	542,731	80,802	51,105	
05	AMASYA	51,940	54,572	53,737	3,021
06	ANKARA	461,947	412,405	189,184	123,448
07	ANTALYA	81,637	221,894	90,845	7,070
08	ARTVİN	169,473	103,564	103,522	5,208
09	AYDIN	30,330	26,003	10,600	111
10	BALIKESİR	132,230	81,877	77,709	55,744
11	BİLECİK	21,397	6,043	5,887	5,290
12	BİNGÖL	313,771	189,526	189,526	166,638
13	BİTLİS	219,840	122,878	44,480	40,127
14	BOLU	90,716	34,890	5,549	494
15	BURDUR	66,717	9,122	9,126	4,486
16	BURSA	78,012	25,989	23,174	20,960
17	ÇANAKKALE	66,626	30,548	26,199	20,059
18	ÇANKIRI	232,689	129,807	129,236	116,769
19	ÇORUM	180,666	90,536	83,140	34,647
20	DENİZLİ	68,057	21,752	20,480	10,444
21	DİYARBAKIR	181,803	307,214	304,538	53,191

(1998-2019)					
Province-Code	Province	Pastures (TURKSTAT)	Total Determination (ha)	Total Restriction (ha)	Total Allocation (ha)
22	EDİRNE	88,087	57,207	57,207	53,440
23	ELAZIĞ	268,912	225,306	47,461	35,740
24	ERZİNCAN	449,432	429,226	262,382	71,133
25	ERZURUM	1,448,466	939,180	887,484	766,283
26	ESKİŞEHİR	343,880	170,284	104,725	7,101
27	GAZİANTEP	86,683	53,092	48,282	34,616
28	GİRESUN	120,086	105,425	103,265	25,336
29	GÜMÜŞHANE	167,947	174,382	154,435	4,805
30	HAKKARİ	166,559	62,773	62,773	
31	HATAY	11,564	22,570	21,567	17,587
32	ISPARTA	54,557	17,548	13,592	6,885
33	MERSİN	98,342	61,326	61,326	59,873
34	İSTANBUL	26,207	10,606	8,027	6,184
35	İZMİR	109,722	36,854	35,435	13,178
36	KARS	312,898	350,000	83,200	157,941
37	KASTAMONU	89,965	25,942	25,763	24,270
38	KAYSERİ	539,818	649,587	588,225	449,656
39	KIRKLARELİ	64,809	35,549	33,523	21,444
40	KIRŞEHİR	129,220	224,213	102,475	27,545
41	KOCAELİ	8,234	2,282	2,282	
42	KONYA	736,852	718,966	483,896	459,768
43	KÜTAHYA	92,447	36,560	32,637	7,491
44	MALATYA	363,449	269,741	109,842	3,282
45	MANİSA	93,375	33,534	24,113	106
46	KAHRAMANMARAŞ	285,846	172,889	166,306	130,731
47	MARDİN	75,682	42,352	6,670	1,200
48	MUĞLA	17,878	14,999	14,726	170
49	MUŞ	371,635	219,452	713	
50	NEVŞEHİR	56,821	72,140	70,675	70,675
51	NİĞDE	289,115	637,330	281,634	105,827
52	ORDU	69,728	49,002	48,704	67,732
53	RİZE	76,403	93,760	93,600	8,755
54	SAKARYA	16,972	7,209	6,348	455
55	SAMSUN	46,773	14,679	14,566	9,553
56	SİİRT	119,228	110,972	24,436	20,439

(1998-2019)					
Province-Code	Province	Pastures (TURKSTAT)	Total Determination (ha)	Total Restriction (ha)	Total Allocation (ha)
57	SİNOP	21,445	2,056	1,730	1,474
58	SİVAS	1,114,998	790,593	782,055	768,810
59	TEKİRDAĞ	63,984	33,111	32,855	31,438
60	TOKAT	126,020	51,994	42,653	21,419
61	TRABZON	154,630	122,110	101,630	5,616
62	TUNCELİ	126,741	199,843	199,843	
63	ŞANLIURFA	88,292	187,870	20,107	170
64	UŞAK	59,305	26,088	26,101	25,828
65	VAN	532,862	1,191,064	505,802	342,825
66	YOZGAT	162,762	143,907	123,185	111,438
67	ZONGULDAK	7,856	1,896	1,764	706
68	AKSARAY	213,459	191,567	141,214	6,520
69	BAYBURT	110,708	331,017	191,077	17,352
70	KARAMAN	216,740	203,182	145,216	133,245
71	KIRIKKALE	71,881	54,292	43,089	8,880
72	BATMAN	41,896	17,694	15,065	5,192
73	ŞIRNAK	314,656	15,033	15,033	15,033
74	BARTIN	5,425	15,769	15,769	1,011
75	ARDAHAN	245,823	15,337	15,337	15,337
76	IĞDIR	122,331	111,283	90,003	50,853
77	YALOVA	3,076	900	900	472
78	KARABÜK	19,478	4,525	4,525	3,526
79	KİLİS	16,346	9,410	8,598	8,563
80	OSMANİYE	10,834	4,724	3,744	102
81	DÜZCE	7,372	2,146	2,146	797
TOTAL (ha)		14,616,687	12,002,335	8,258,011	5,035,091

Pasture improvement and management projects are implemented by the Ministry of Agriculture and Forestry in order to increase the grazing capacity by improving the pastures, summer pastures and winter pastures, to improve the quality of grass, to prevent erosion by implementing soil conservation measures. A total of 1,781 pasture improvement and management projects have been implemented on an area of 10,510,691 decares, so far.

5. Energy

5.1. Renewable Energy Resources

Population growth in the world, urbanization and industrialization phenomena, trade opportunities that have increased as a result of globalization increase the demand for natural resources and energy. Turkey has been the one of the where the fastest growth occurred in the last 10 years of energy demand in OECD

countries. The projections made by the Ministry of Energy and Natural Resources show that this trend will continue in the medium and long term.

The strategies and policies of the Ministry of Energy and Natural Resources are based on energy supply security, alternative energy resources, resource diversity, the inclusion of domestic resources in the economy, sustainability, liberalization in energy markets, and energy efficiency.

Turkey's minimum technical renewable energy sources (RES) potential according to various sources is as follows: 140,000 GWh / year economic power capacity of 48,000 MW of wind capacity; 1,635 kWh / m2-year average global solar radiation, 35,500 MWt theoretical geothermal apparent heat capacity, 4,500 MWe theoretical geothermal electricity potential, 2,000 MWe economic geothermal electricity potential and 8.6 MTOE biomass potential.

Turkey's electricity installed capacity has amounted to 91,267 MW by the end of 2019. As a result of the incentives provided to renewable energy sources, the share of renewable energy sources, especially hydraulic, wind, solar and geothermal, in the installed power has increased in recent years. As of the end of 2019, 49.05% of our country's installed power is from renewable energy and 50.95% is from other resources.

Efforts to utilize hydraulic energy, constituting the majority of its renewable installed power, to the maximum extent are still in progress. Within the scope of these efforts, hydraulic energy installed power of Turkey reached 28,503 MW in 2019.

Electricity generation in our country in 2019 was approximately 303.9 TWh, while the share of natural gas in electricity generation was 30.34% as of the end of 2018, this rate decreased to 18.85% at the end of 2019 and 29.23% of the total electricity generation was from hydroelectric power plants. 17.28% came from domestic coal, 19.87% from imported coal, 7.15% from wind,and 2.95% from geothermal resources.

Map 7 - Solar Energy Potential
http://www.yegm.gov.tr/MyCalculator/Default.aspx

Map 8 - Wind Energy Potential Atlas of Turkey
(https://www.eigm.gov.tr/tr-TR/Sayfalar/REPA)

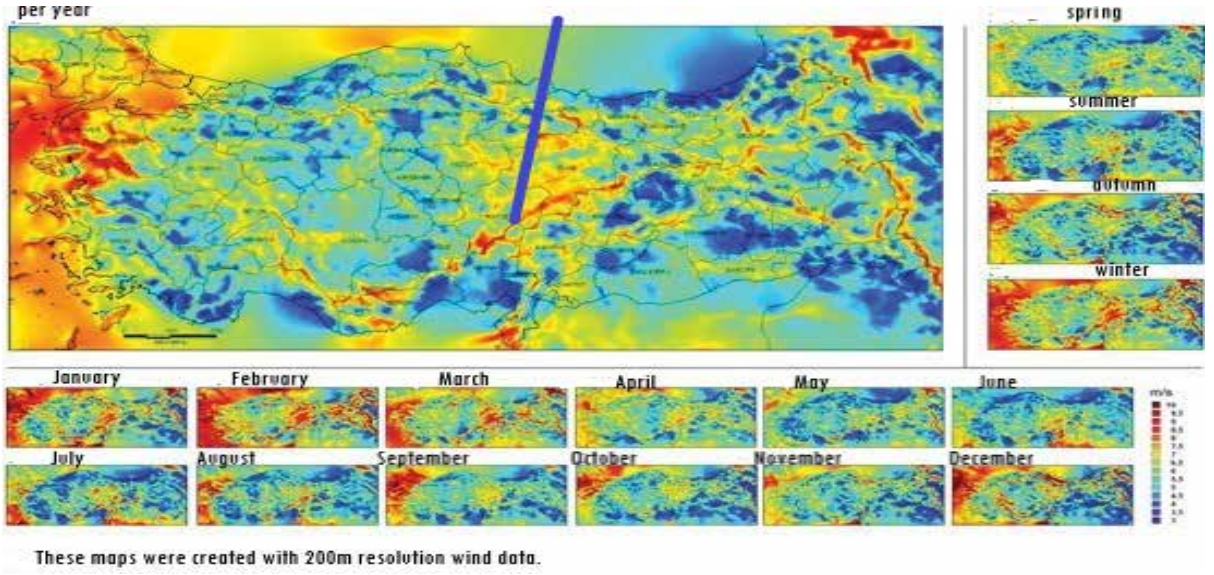


Table 17 – Provincial Renewable Energy Installed Capacity (MW) as of August 2020 (DGEA, 2020)

PROVINCE	SOLAR	WASTE HEAT	WIND	BIOMASS	STREAM	DAM	GEOTHERMAL
ADANA	129	15	0	29	473	1.363	0
ADIYAMAN	110	0	25	0	175	40	0
AFYONKARAHİSAR	232	2	313	43	3	0	3
AĞRI	15	0	0	0	0	0	0
AKSARAY	90	0	0	10	0	0	0
AMASYA	33	4	128	12	140	24	0
ANKARA	359	13	0	89	32	371	0
ANTALYA	145	15	0	38	135	672	0
ARDAHAN	2	0	0	0	26	210	0
ARTVİN	0	0	0	0	385	1,417	0
AYDIN	115	5	249	24	45	93	768
BALIKESİR	91	12	1,144	51	5	100	0
BARTIN	0	5	0	0	20	0	0
BATMAN	18	0	0	1	0	52	0
BAYBURT	12	0	0	2	26	0	0

PROVINCE	SOLAR	WASTE HEAT	WIND	BIOMASS	STREAM	DAM	GEOTHERMAL
BİLECİK	78	0	60	2	25	0	0
BİNGÖL	23	0	0	1	51	954	0
BİTLİS	25	0	0	1	31	0	0
BOLU	4	6	0	1	52	74	0
BURDUR	69	0	0	5	2	78	0
BURSA	51	34	154	24	54	138	0
ÇANAKKALE	14	15	589	0	0	2	16
ÇANKIRI	51	0	0	0	7	1	0
ÇORUM	109	0	0	7	52	313	0
DENİZLİ	188	0	66	1	62	120	350
DİYARBAKIR	60	0	0	4	48	2,203	0
DÜZCE	1	6	0	16	80	9	0
EDİRNE	6	1	136	8	0	0	0
ELAZIĞ	172	4	0	2	107	2,338	0
ERZİNCAN	42	0	0	9	148	156	0
ERZURUM	98	6	0	2	284	483	0
ESKİŞEHİR	158	0	0	14	17	278	0
GAZİANTEP	148	2	63	8	2	189	0
GİRESUN	2	0	0	0	792	56	0
GÜMÜŞHANE	1	0	0	0	239	418	0
HAKKARİ	0	0	0	0	48	0	0
HATAY	17	0	339	11	10	3	0
IĞDIR	1	0	0	1	23	0	0
ISPARTA	140	28	60	3	112	99	0
İSTANBUL	8	32	266	67	0	0	0
İZMİR	258	10	1,485	37	0	0	0
KAHRAMANMARAŞ	191	39	85	6	518	787	0
KARABÜK	13	0	0	0	71	0	0
KARAMAN	66	0	7	2	160	369	0
KARS	6	0	0	0	116	33	0
KASTAMONU	7	0	0	2	97	0	0
KAYSERİ	308	1	273	8	157	104	0
KIRIKKALE	50	0	0	1	34	54	0
KIRKLARELİ	1	4	116	22	0	0	0
KIRŞEHİR	45	0	168	1	1	128	0
KİLİS	21	0	0	1	0	0	0

PROVINCE	SOLAR	WASTE HEAT	WIND	BIOMASS	STREAM	DAM	GEOTHERMAL
KOCAELİ	11	27	10	21	4	0	0
KONYA	603	0	153	28	21	0	0
KÜTAHYA	114	0	0	4	11	0	0
MALATYA	101	0	10	9	59	0	0
MANİSA	206	1	691	13	0	69	379
MARDİN	27	0	0	12	5	0	0
MERSİN	153	28	190	20	370	198	0
MUĞLA	104	0	189	11	139	175	0
MUŞ	3	0	0	0	13	160	0
NEVŞEHİR	130	0	0	3	40	47	0
NİĞDE	131	0	0	4	0	0	0
ORDU	0	0	0	1	381	108	0
OSMANİYE	76	0	258	3	155	648	0
RİZE	0	0	0	0	360	0	0
SAKARYA	0	4	0	23	63	0	0
SAMSUN	26	42	53	11	34	1,328	0
SİİRT	7	0	0	0	67	696	0
SİNOP	0	0	0	0	47	513	0
SİVAS	84	2	150	3	178	177	0
ŞANLIURFA	351	0	0	13	51	3,077	0
ŞIRNAK	18	0	0	0	1	0	0
TEKİRDAĞ	3	0	177	36	0	0	0
TOKAT	17	0	131	2	289	240	0
TRABZON	0	0	0	4	592	0	0
TUNCELİ	1	0	0	0	25	82	0
UŞAK	94	0	54	2	0	0	0
VAN	60	2	0	4	51	15	0
YALOVA	1	0	84	3	0	0	0
YOZGAT	65	0	0	1	27	0	0
ZONGULDAK	0	0	0	33	45	0	0

Turkey announced its National Energy and Mining Policy in 2017. Ensuring energy supply security, predictable markets in energy and natural resources, and indigenization titles are the pillars of this document. The most important priority for Turkey is to reduce the dependency on imports using indigenous and renewable energy potential. Therefore, Turkey continues its attempts to increase the share of renewable energy sources.

10 GW of additional wind and 10 GW of additional solar installed power is planned to be put into use between 2017-2027. However, Turkey will include nuclear energy in its energy portfolio in 2023 and carries on its hydrocarbon exploration activities to reduce dependence on foreign oil and natural gas. The energy sector targets within the scope of the 11th Development Plan for 2023 are given in Table 18.

Table 18 - Energy Sector Targets for 2023
(11th Development Plan, 2020)

Targets	Target Year: 2023
Primary Energy Demand (BTEP)	174,279
Electrical Energy Primary Energy Demand (TWh)	375.8
Per Capita Primary Energy Consumption (TEP / Person)	2.01
Per Capita Electrical Energy Consumption (kWh / Person)	4,324
Share of Natural Gas in Electricity Generation (%)	20.7
Share of Renewable Resources in Electricity Generation (%)	38.8
The Amount of Electric Energy Produced from Domestic Sources (TWh)	219.5
Electricity Installed Power (MW)	109,474

Table 19 - Gross Energy Supply of Renewable Energy Sources in Turkey (million toe)
(DGEA, 2020)

	2013	2014	2015	2016	2017	2018
Wood	2.256	2.162	1.811	1.644	1.356	0.971
Animal and Herbal Wastes	1.093	1.007	1.006	1.082	1.050	1.883
Hydraulic	5.110	3.495	5.775	5.782	5.007	5.155
Geothermal (Including Geothermal Heat)	2.636	3.524	4.805	6.034	7.128	8.343
Biofuel	0.050	0.077	0.121	0.117	0.125	0.159
Wind	0.650	0.733	1.002	1.334	1.540	1.716
Solar	0.795	0.803	0.828	0.917	1.091	1.547

5.2. Electricity Production

The distribution and contributions of the electrical energy produced in 2019 to organizations are given in Table 20 below. The total electricity generation in 2019 was approximately 303,9 TWh.

According to unconfirmed data of 2019,Turkey's electricity production was 303.898 GWh and gross demand was 303,320 GWh. As of the end of 2019, the export value was 2,212 GWh and the export value was 2,789 GWh.

Table 20 - Electricity Production and Shares by Institutions (DGEA, 2020)

	As of 2019	
	Production Amount (GWh)	Production Share (%)
EUAS	59,350	19.53%
Transfer of Operating Rights	11,107	3.65%
Build-Operate	11,393	3.75%
Build-Operate-Transfer	709	0.23%
Freelance Production Companies	210,618	69.31%
Unlicensed Power Plants	10,721	3.53%
Total	303,898	100.0%

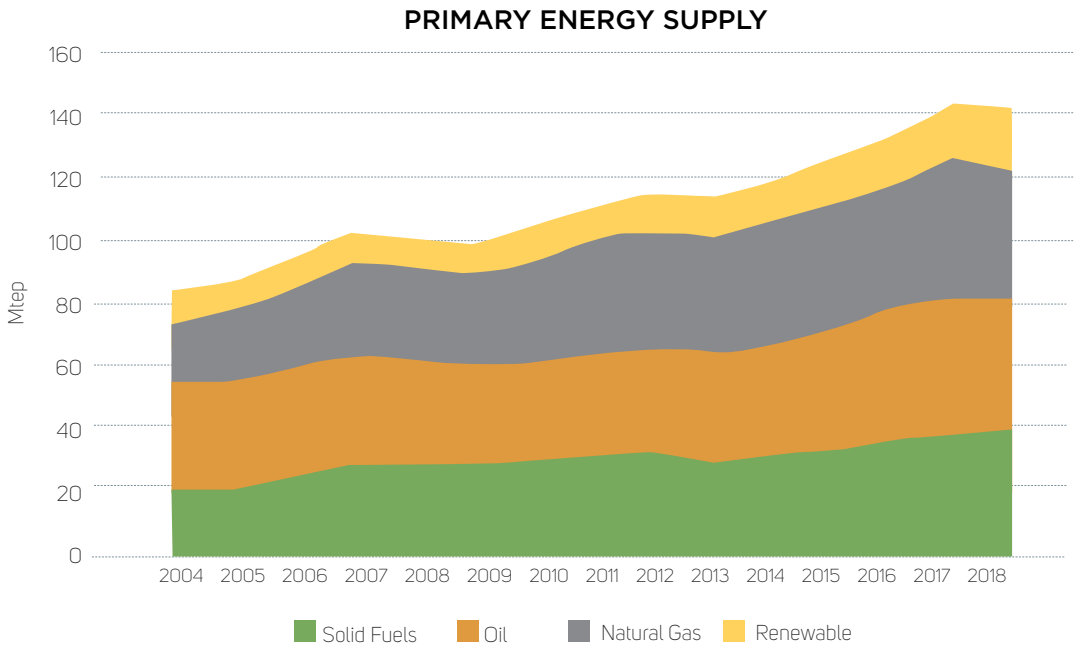
Table 21 - Distribution of Electricity Production by Resources (DGEA, 2020)

	As of the end of 2019	
	Production Amount (GWh)	Production Share (%)
NATURAL GAS	57,288	18.85%
LIGNITE	46,872	15.42%
BITUMINOUS COAL	3,303	1.09%
ASPHALTITE COAL	2,324	0.76%
IMPORTED COAL	60,395	19.87%
FUEL OIL	335	0.11%
DIESEL	1	0.00%
OTHER	0	0.00%
BIOMASS	4,624	1.52%
GEOTHERMAL	8,952	2.95%
HYDRAULIC TOTAL	88,823	29.23%
SOLAR	9,250	3.04%
WIND	21,731	7.15%
TOTAL PRODUCTION	303,898	100.00%

5.3. Total Primary Energy Supply

Graph 4 offers Turkey's development by years of primary energy supply. Our country's primary energy supply was realized as 143.7 million toes in 2018. The share of natural gas in the primary energy supply is 28.7%, the share of coal is 28.4%, the share of oil is 29.17%, the share of renewable is 13.7%.

Graph 4 – Turkey's Primary Energy Supply
(Ministry of Energy and Natural Resources, 2020)



5.4. Energy Consumption by Sectors

It is estimated that the primary energy demand of our country will reach 174.279 thousand TOE in 2023. Turkey's energy consumption distribution by sector for 2018 is presented in Graph 5. When Graph 5 is analyzed; it was used 24% in the conversion and energy sector, 25% in the industry sector, 20% in the transportation sector, 15% in the housing sector, 8% in the trade, and services sector and 3% in the livestock sector.

The rate of meeting the primary energy demand of our country with domestic production was 27.6% in 2018. In other words, Turkey's dependence on foreign energy is 72.4%.

Graph 5 - Sectoral Distribution of Turkey's 2018 Energy Consumption
(Ministry of Energy and Natural Resources, 2020)

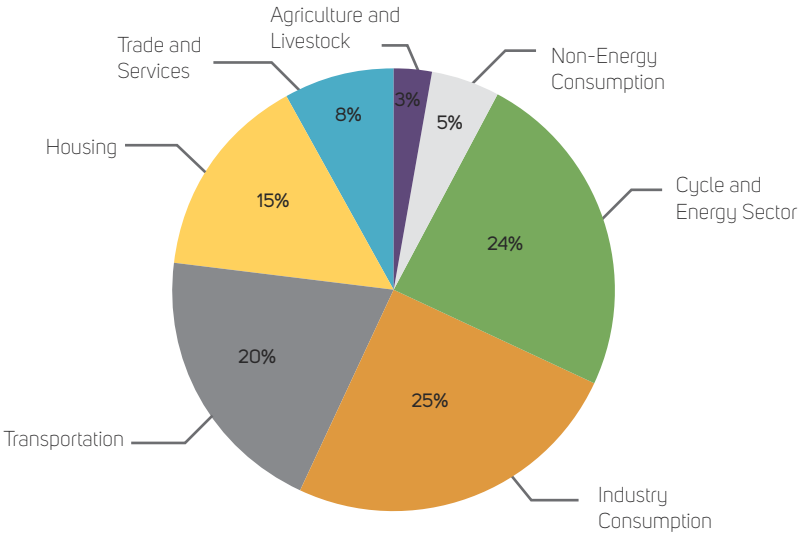


Table 22 - Distribution of Turkey's Net Electricity Consumption by Sectors (TURKSTAT, 2020)

Year	Total	Residence	Trade	Government Office	Industry	Illumination	Other(*)
	(GWh)	(%)					
2015	217,312	22.0	19.1	3.7	47.6	1.9	5.7
2016	231,204	22.2	18.8	3.9	46.9	1.8	6.4
2017	249,023	21.8	19.8	4.1	46.8	1.8	5.7
2018	258,232	21.1	20.4	4.6	45.6	1.8	6.5

(*) This includes consumptions such as agriculture, livestock, fishing, drinking and utility water pumping facilities, public services, etc.

5.5. Studies on Energy Efficiency

Turkey's primary energy intensity index and ultimate energy density index decreased by 1.5% and 1.6%, respectively on an average annual basis in the 2000-2018 period. When compared to the year 2000; there is an improvement of 24.0% in the primary energy intensity index and 25.6% in the ultimate energy density index in 2018.

Within the scope of the National Energy Efficiency Action Plan to be implemented between 2017-2023; Turkey's primary energy consumption is aimed to have been reduced by 14% in 2023 through a total of 55 actions identified in six categories including building and services, energy, transport, industry and technology, agriculture and horizontal issues. Until 2023, a cumulative saving of 23.9 MTEO and an investment of 10.9 billion dollars for this savings are foreseen. With the effect of savings, it is aimed to prevent 66.6 million tons of CO_2 equivalent greenhouse gas emissions. With this plan, the total amount of financial savings expected between 2017-2023 was calculated at the level of 8.4 billion dollars. The cumulative savings to be achieved by 2033 with 2017 prices will be USD 30.2 billion, and the effect of some savings will continue until 2040.

Within the framework of the actions on NEEAPs, it is calculated that a total of 4,149 million USD was invested in energy efficiency for the 2017-2019 period, and 2,744 ktep energy savings, which is equal to 960 million USD, were achieved.

The Presidential Circular No. 2019/18 titled "Energy Saving in Public Buildings" was published in the Official Gazette no. 30860 dated 16/08/2019 within the scope of the implementation of the energy efficiency project in public buildings included in Article 492 of the 11th Development Plan. Within the scope of the circular; public buildings that are obliged to appoint an energy manager under the Energy Efficiency Law are aimed to save at least 15% energy by the end of 2023.

"Saving Target and Implementation Guide in Public Buildings" was published on 20/09/2019 under the coordination of the Ministry of Energy and Natural Resources to achieve the savings target for the period of 2020-2023, to determine the energy efficiency measures to be applied and to provide maximum savings by following the practices in public institutions and organizations.

6. Transportation

6.1. Number of Owned Vehicles in Turkey

The change in the number of motor vehicles owned in Turkey between the years 2015-2019 are given in Table 23.

Table 23 - Number of Motor Vehicles by Years, 2015 - 2019
(TURKSTAT, 2020)

	2015	2016	2017	2018	2019
TOTAL	**19,994,472**	**21,090,424**	**22,218,945**	**22,865,921**	**23,156,975**
Automobile	10,589,337	11,317,998	12,035,978	12,398,190	12,503,049
Minibus	449,213	463,933	478,618	487,527	493,373
Bus	217,056	220,361	221,885	218,523	213,358
Van	3,255,299	3,442,483	3,642,625	3,755,580	3,796,919
Trucks (1)	804,319	825,334	838,178	845,462	844,481
Motorcycle	2,938,364	3,003,733	3,102,800	3,211,328	3,331,326
Special purpose	45,732	50,818	60,099	63,359	65,470
Tractor	1,695,152	1,765,764	1,838,222	1,885,952	1,908,999

(1)Also includes heavy tonnage freight vehicles (tow truck, dump truck, tanker, garbage truck, etc.)

6.2. Domestic Passenger and Cargo Transportation in Turkey

According to 2019 data; cargo and passenger transportation in Turkey is carried out with a very large proportion of road transport. The General Directorate of Highways has a total road network of 68,266 km, including 3,095 km (5%) of motorways as of April 2020.

Table 24 – Domestic Cargo and Passenger Transportation by Transport Modes for 2019
(Ministry of Transport and Infrastructure, 2020)

Road	**CARGO**	**PASSENGER**
	TonxKm (million)	PassangerxKm (million)
	266,502	329,363
	Road Network	
	State and Provincial road (Km	Highway (Km)
	65,174	3,073

Seaway*	**CARGO**	**PASSENGER**
	TonxKm (million)	PassangerxKm (million)
	15.216	1.950

* These are cargo and passenger transports in 2019 cabotage under the responsibility of the General Directorate of Maritime Affairs. Passenger x mile and ton x mile values have been converted to km.

Airway	CARGO	PASSENGER
	TonxKm (million)	PassangerxKm (million)
	13	34.996

Railway*	CARGO	PASSENGER
	TonxKm (million)	PassangerxKm (million)
	14.707	4.912

*This is the Railway 2019 outline transport.

6.3. International Maritime Transportation

The International Maritime Organization (IMO) has a strategy covering conducting global capacity-building projects to set regulatory rules for preventing air pollution and reducing greenhouse gas emissions from international maritime transportation and supporting the effective implementation of these regulatory rules in the world and encourage innovations and technology transfer.

Turkey became a party, with the Law No. 6438 published in the Official Gazette No. 28588 dated 15 March 2013, to the "Convention on the Prevention of Air Pollution from Ships" known as "1997 Protocol" or "Annex-VI" of the International Convention for the Prevention of Pollution from Ships (MARPOL) 73/78, which was adopted in 1997 at the IMO General Assembly and entered into force on 19 May 2005.

With the said Protocol, in addition to technical and operational measures to reduce ship-sourced air pollution and emissions, rules for gradually improving fuel quality, compulsory energy efficiency measures to reduce greenhouse gas emissions were introduced and started to be implemented.

The first IMO Strategy was adopted to reduce greenhouse gas emissions from ships in April 2018. With this strategy, it is aimed to reduce pollution by at least 50% from 2008 to 2050 in the total greenhouse gas emissions arising from international maritime transportation.

In this framework, it was decided to collect fuel consumption data from ships with the MEPC.278 (70) decision of IMO in March 2018. In the context of the implementation of this rule; Class Societies were authorized by the Ministry of Transport and Infrastructure to provide services on Turkish Flagged ships, and data such as the type of fuel used, fuel consumption, cruising distance, and durations belonging to the ship for 2019 were collected and entered into IMO's database at the beginning of 2020. The data collected by IMO are analyzed between 2020 and 2022 and also it is aimed to determine short, medium, and long term actions in 2023.

With the amendment in Annex 6 of the MARPOL Convention, IMO has started to apply the rule by reducing the sulfur content in the fuels used in ships from 3.5% to 0.5% as of 01/01/2020. Efforts are carried out in our region to declare the Mediterranean as a Sulfur Emission Control Area (SECA). In the SECA, the ships that do not have an appropriate exhaust gas cleaning device can use fuel with a sulfur content of 0.5%.

The International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention) was enacted by IMO and entered into force on 08.09.2017. Our country signed the BWM Agreement on October 14, 2014. The Ministry of Transport and Infrastructure has initiated the "Green Port" project to bring in more environmentally sensitive port facilities to the country to solve and, if possible, eliminate the experienced or potential environmental problems. As of the end of 2019, 15 port facilities were awarded Green Port Certificates, and 4 port facilities were entitled to receive Green Port Certificate.

Besides, the Ministry of Transport and Infrastructure initiated the "Carbon Free Airport Project" to control the possible effects of all ongoing activities at the airports, to leave a more livable world to the next generations, and to ensure sustainable airport management with the measures taken against global warming and climate change.

6.4. General Transportation Policies Regarding Energy Efficiency and Environment

The National Transport Master Plan has a series of policy measures aimed at Turkey's transport sector more sustainable and environmentally friendly by supporting energy efficiency and low-carbon technologies.

These are; prioritizing environmentally friendly transport with high energy efficiency; monitoring the greenhouse gas emissions and emissions trading; strengthening environmental control and enforcement mechanism, developing a new financing framework to develop and disseminate technologies that improve the infrastructure of energy efficiency and decarbonization. As a result, it is to systematically include environmental impact assessment in new transport infrastructure projects.

Turkey has the desire to become a regional transit hub for international transportation flows and to be among the first 15 countries in the Logistics Performance Index to ensure continuous growth in the economy and increase its competitiveness. Facilitating the support of the logistics sector by clarifying the concept of "Green / Eco-Friendly Logistics" by taking into account the intermodal system, alternative fuel technologies and traffic regulation measure are among the goals set by Turkey to achieve this desire.

7. Tourism

According to World Tourism Organization data, Turkey ranks 6th in the world and 4th in Europe in terms of the number of tourists in 2019. In terms of tourism revenues compared to the same year, it ranks 13th in the world country ranking and 6th in Europe.

Table 25 - Monthly and Yearly Distribution of the Foreign Tourists Visited Turkey (Ministry of Culture and Tourism, 2016)

MONTHS	YEARS			
	2016	2017	2018	2019
JANUARY	1,170,333	1,055,474	1,461,570	1,539,496
FEBRUARY	1,240,633	1,159,833	1,527,070	1,670,238
MARCH	1,652,511	1,587,007	2,139,766	2,232,358
APRIL	1,753,045	2,070,322	2,655,561	3,293,176
MAY	2,485,411	2,889,873	3,678,440	4,022,254
JUNE	2,438,293	3,486,940	4,505,594	5,318,984
JULY	3,468,202	5,075,961	5,671,801	6,617,380
AUGUST	3,183,003	4,658,463	5,383,332	6,307,508
SEPTEMBER	2,855,397	4,076,630	4,792,818	5,426,818
OCTOBER	2,449,948	2,992,947	3,755,467	4,291,574
NOVEMBER	1,353,280	1,652,795	1,966,277	2,190,622
DECEMBER	1,302,157	1,703,789	1,950,705	2,147,878
TOTAL	25,352,213	32,410,034	39,488,401	45,058,286

8. Agriculture

8.1. Organic Agriculture and Good Agricultural Practices

In organic agriculture, no chemicals or pesticides are used in all processes, from growing, harvesting, harvesting, cutting, processing, sorting, packaging, labeling, storage, storage, transportation, and the delivery of the product to the consumer. Organic farming primarily protects and improves the health of the farmer and his family in general, as farmers and their families are more frequently exposed to pesticides. As organic agriculture becomes widespread, the rate of diseases that are very expensive to treat will decrease and the economy will be affected positively.

Organic agriculture and good agricultural practices (GAP) is a production method that ensures the protection of natural resources, traceability, and sustainability in agriculture and food safety by making an agricultural production that does not harm the environment, human and animal health.

Issues related to organic farming activities are carried out under the provisions of the Organic Agriculture Law No. 5262 and the "By-Law on the Principles and Implementation of Organic Agriculture" published in the Official Gazette No. 27676 dated 18.08.2010 based on this Law. Activities related to Good Agricultural Practices are carried out under the provisions of the "By-Law on Good Agricultural Practices" published in the Official Gazette no. 27778 dated 07.12.2010 and the Circular on control points and compliance criteria issued based on this by-law on crop production, animal production, and aquaculture.

"The Extension and Control of Organic Agriculture Project" has been implemented since 1997.

Our production area, which started with 57.365 hectares in 2002 within the scope of organic agriculture, increased to 545,869 hectares in 2019, and our production area, which started with 53,607 in 2007 within the scope of good agricultural practices, increased to 5,396,073 da in 2019. Within the scope of good agricultural practices and organic agriculture activities, it is aimed to increase the number of producers and production areas every year.

It is aimed that the organic farming area, which was 545,869 hectares as of 2019, will increase to 1,250,000 hectares in 2024 and the number of 74,545 farmers to reach 125,000 farmers. Besides, it is aimed to increase the share of organic farming areas, which was 2.36% for 2019, to 5% for 2024 within the total agricultural areas.

In Table 26, 27, and 28, organic and good agricultural practices production data are given by years.

Table 26 - Organic Agricultural Production Data (Including the Transition Period) (Ministry of Agriculture and Forestry, 2020)

Years	Number of Products	Number of Farmers	Cultivated Area (ha	Natural Harvest Area (ha)	Total Production Area (ha)	Amount of Production (ton)
2015	197	69,967	486,069	29,199	515,268	1,829,291
2016	225	67,878	489,671	34,106	523,778	2,473,600
2017	214	75,067	520,885	22,148	543,033	2,406,606
2018	213	79,563	540,000	86,885	626,885	2,371,612
2019	213	74,545	512,586	33,283	545,869	2,030,466

Table 27 - Organic and transition process livestock (number)
(Ministry of Agriculture and Forestry, 2020)

Years	Number of Farmers	Cattle	Small Cattle	Poultry
2015	221	8,867	42,896	981,006
2016	207	8,340	26,329	1,212,542
2017	137	6,913	22,771	1,267,307
2018	177	6,149	34,576	1,258,995
2019	182	4,540	17,475	747,598

Table 28 - Good Agricultural Practices
(Ministry of Agriculture and Forestry, 2020)

Years	Number of Provinces	Number of Producers	Cultivated Area (da)
2015	61	39,740	3,465,695
2016	64	55,609	4,741,075
2017	64	72,236	6,247,107
2018	63	73,286	6,156,137
2019	66	61,894	5,396,073

8.2. Environmentally Based Agricultural Land Protection Program Practices

Environmentally Based Agricultural Land Protection (ÇATAK) was prepared to take exemplary cultural measures for the protection of soil and water quality, the sustainability of renewable natural resources, prevention of erosion, and elimination of negativities in plant production in areas where intensive agricultural activities are carried out, where there is erosion, soil and water pollution, and the natural balance has begun to deteriorate as well as to improve the soil structure with "Minimum Soil Tillage Agriculture" practices and increase the agricultural income of the producers by reducing input costs.

It is aimed to enable producers to evaluate the impact of their agricultural activities on the environment and to protect the environment by considering the natural plant and animal tissue through protecting the soil and water structure and natural vegetation and extending the organic agriculture and good agricultural practices in the areas where project implementations are planned to be carried out.

Practices were carried out in 58 provinces, on an area of 721,660 hectares, and a total of 734,415,415 TL support payments were made to achieve the project goals between the years 2006 and 2019. Practices are planned to be carried out in 58 provinces and on 64,400 hectares for 2020.

The project on "Evaluation of Agri-environmental Policies in Turkey within the framework of Environmentally Based Agricultural Land Protection Practices (ÇATAK)" was carried out in 2015.

According to the project results; the producers state that environmental awareness has increased, and the agricultural-related water and soil pollution in their region has decreased with the ÇATAK Program; according to the Agriculture-Environment Footprint Index, the index value before ÇATAK was 3,64, while it was 5,72 after ÇATAK. These data show that there is a significant improvement in environmental quality due to the ÇATAK Program. The project will be terminated by the end of 2020.

8.3. Use of Fertilizer, Soil Conditioner, and Pesticides

Turkey remains below the European Union, the world average, and our potential need in terms of fertilizer use. A total of 2.5 million tons of chemical fertilizer is used on the nutrient basis in Turkey in 2019.

8.4. Protection and Use of Agricultural Lands

Law No. 5403 on Soil Conservation and Land Use aims at legal regulation on soil conservation and land use, which is increasing in importance, potential, and scope both in the world and in our country.

The areas susceptible to desertification and the great plains, which have an important place in the economy of the country and are in danger of degradation as a result of improper use, are declared as protected areas within the framework of the law. Thus, the Ministry of Agriculture and Forestry, together with the local units, ensures that these places are planned quickly by looking after the public interest. For this purpose, 265 plains and 7,137,870 hectares of land in 64 provinces have been determined as great plain protection areas.

Agricultural areas with smooth geometric shapes are formed as a result of the agricultural infrastructure practices. These areas can be cultivated as their topographic structures have been corrected and land reclamation works have been completed. As a result of land management, sales, and inheritance practices, the economic integrity of the lands is not damaged. The fragmentation of the land is prevented and it is aimed to pass the land into the hands of competent heirs, taking into account the personal abilities and situations.

The "By-Law on Transfer of Ownership of Agricultural Lands" prepared within the scope of the Law No. 6537 amending Law No. 5403 on Soil Conservation and Land Use, was published in the Official Gazette dated 31.12.2014 and entered into force.

2.930.580 sales and inheritance applications were evaluated following the provisions of the Law by the Ministry of Agriculture and Forestry within the approximately 5 years of law enforcement. "Agricultural Land Management Portal (TAYPORTAL)" has been put into practice in 81 provinces and districts to implement the provisions of the law regarding inheritance and sale.

Table 29 - Number of Parcels Requested to Transfer by Way of Sale and Inheritance (Ministry of Agriculture and Forestry, 2020)

Requested to Transfer by Way of Sale		Permitted		Unpermitted	
Parcel Amount	Area (da)	Parcel Amount	Area (da)	Parcel Amount	Area (da)
2,615,977	52,456,875	2,455,398	44,565,405	160,579	7,891,470
Parcels Requested to Transfer by Way of Inheritance		**Permitted**		**Unpermitted**	
Application Amount	Area (da)	Application Amount	Area (da)	Application Amount	Area (da)
314,603	4,335,840	259,422	3,461,200	55,181	874,640

8.5. Land Use Planning Studies

"Soil Protection and Land Use Law" was enacted on 19 July 2005. Among the most important issues in the law, the protection of agricultural lands is the first and making land-use plans are the second.

"Land Use Planning" processes are conducted using data on soil and water resources by the Ministry of Agriculture and Forestry in the whole of Turkey. Within the scope of these studies, it is aimed to protect the agricultural lands, to provide convenience for investors in providing space, and to establish spatial planning and production axes.

The project on "Integrated Land Use Planning for Food Security by Improving Climate Resilience and Ecosystem Management (ILUP)" is planned to be executed by the United Nations Food and Agriculture Organization (FAO) together with the Ministry of Agriculture and Forestry as a pilot practice in an area of 114,000 hectares of Ayaş, Ankara between 2019-2021.

The target for 2023 in this regard is the completion of Land Use Plans and Agricultural Land Use Plans. The plans produced, it is aimed to protect fertile agricultural lands, to plan production, and to realize the targets set in agricultural production.

Research projects on "Determination of Land Suitability Classes" according to the strategic products grown in our country have been included in the program. Determining the Land Suitability classes will be an important resource in the development of the model to be used by decision-makers in terms of determining newly suitable areas, and creating future-oriented strategic, physical, and economic plans.

8.6. Fisheries

The main policy of our country regarding fisheries is the protection and sustainable management of fisheries resources in our sea and inland waters. The goal in the fisheries is to manage and operate the resources within the framework of sustainability principles, by considering the balance of protection and use. For this, a more protective approach has been adopted in hunting management and the principle of sustainability has been brought to the fore. In this context, regulations have been made in the Fisheries Law No. 1380 and its related sub-legislation on the issues of sustainable management of fisheries resources, protection of biodiversity, habitats and natural species, invasive and alien species, preventing the illegal use of fishery products and preventing them from entering the country alive to meet the needs arising from developing technological opportunities, changing scientific, environmental, economic and social conditions.

Inspections to combat illegal hunting are carried out by the Ministry of Agriculture and Forestry, Coast Guard Command, Gendarmerie, and Police units together on a 24-hour basis.

The fishing activities of approximately 1,600 fishing vessels of 12 meters and above in our fishing fleet are monitored by GSM and satellite, and data on fishing activities are recorded using the "Fishing Vessels Monitoring System (BAGİS)", which was put into operation in 2016, and "Electronic Logbook" application.

The support according to the length of the ship was applied to the fishermen who had ships of 10 m or more in return for dismissing their ships voluntarily between the years 2012 and 2018. 1,264 fishing vessels were removed from the fleet and our fishermen were paid 165 million TL.

600-700 thousand tons of fisheries products are produced from our water resources annually, although it changes over the years. Similar to world production, while the amount obtained by hunting in Turkey shows a certain level and fluctuating course, the production of aquaculture continues to increase and the share of cultivation in the total production is increasing. 836,523,7 tons of aquatic products were

produced in Turkey in 2019, with a record increase of 33.1% compared to previous years, while hunting production was 463,168 tons, and aquaculture production was 373,356 tons.

Efforts are carried out to protect sensitive ecosystems, biological diversity, aquatic life, and marine reserve areas in our sea and inland waters. The "Clearing the Seas from Abandoned Fishing Gears Project" has been put into practice, for the first time in our country by only using public funds, for the removal of fishing gears lost and abandoned in the seas due to ground structure, weather conditions, network conflict usage errors or similar reasons. The Project aims to protect the aquatic habitats and to reduce the biological and economic losses by preventing uncontrolled fishing caused by abandoned fishing gears.

Within the scope of this project implemented between 2014 and 2018; 65,000 decares of land were dredged at 600 locations and 450,000 square meters of the net, 4,500 different types of fishing gear were cleaned from our sea and inland waters and recycled. Owing to the project, many habitats such as coral colonies and sea meadows under the nets on the seafloor have come back to life habitat and breeding ground for aquatic species.

37,888,000 pieces of carp, trout, and catfish juveniles were released to our water resources in 2019, as part of a program to fish inland water resources and to reinforce fish stocks by the Ministry of Agriculture and Forestry.

10 thousand sturgeons, 120 thousand turbots, and 5 thousand Karadeniz trout juveniles have been left to our resources by the Ministry of Agriculture and Forestry to supplement the stocks of endangered sturgeon and turbot fish with high economic value and protect and improve the stocks of these species. Furthermore, sea bass and sea bream have been left to the Mediterranean for the first time.

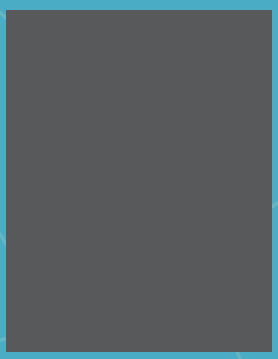
Our country continues its sectoral growth following the "Code of Conduct for Responsible Fisheries" published by FAO. The basic policy of our country regarding fisheries is to manage the resources sustainably by considering the balance of protection and use of fisheries and living spaces. In addition, our country develops aquaculture in our sea and inland waters and ensures supply security in fisheries.

Activities regarding the protection, development, and regulation of fisheries areas are continued to sustain the fisheries activities within the framework of blue growth and sustainable fisheries in our country.

Resources

Ministry of Energy and Natural Resources
Ministry of Culture and Tourism
Ministry of Agriculture and Forestry
Ministry of Transport and Infrastructure
Petroleum Pipeline Company - BOTAŞ
General Directorate of Energy Affairs
General Directorate of Mining and Petroleum Affairs
General Directorate of Mineral Research and Exploration
General Directorate of Meteorology
General Directorate of Forestry
Turkey Statistical Institute

A. AIR



A. AIR

A.1. Protection of Air Quality

Activities and studies on The United Nations Economic Commission for Europe (UNECE) " Convention on Long-range Transboundary Air Pollution (CLRTAP)" and "Protocol on Long-term Financing of the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP)" of the relevant Convention are carried out by the Ministry of Environment and Urbanization.

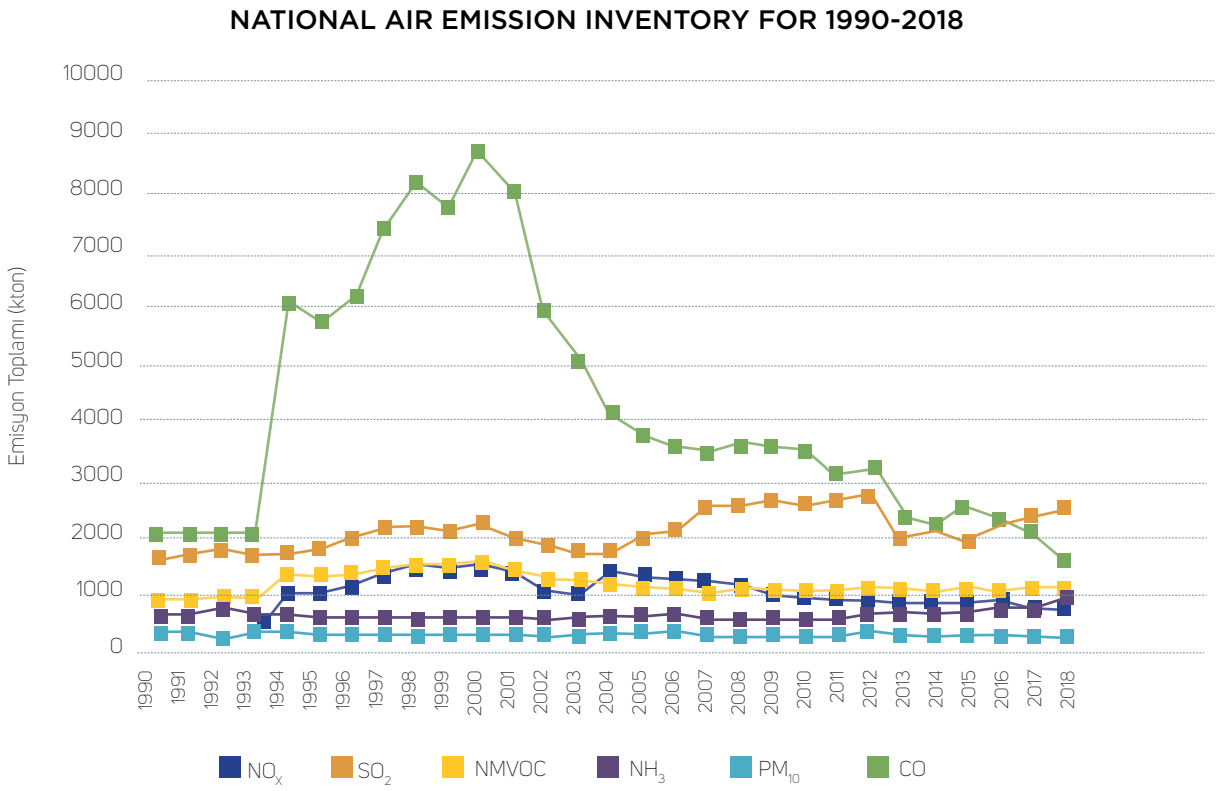
An annual national air pollutant emission inventory is prepared and reported through the European Environment Information and Observation Network (EIONET) together with the UN-EEA Secretariat.

The United Nations Convention on Long-Range Transboundary Air Pollution entered into force on 13.11.1979 and Turkey became a party to the Convention on 18.04.1983.

With the "Protocol for the Long-Term Financing of the Cooperation Program for the Monitoring and Evaluation of the Long-Range Transport of Air Pollutants in Europe (EMEP) Protocol" to which our country became a party on 20.12.1985, collecting air pollutants emission inventory of all parties, modeling inventory data for EMEP region, and it is aimed to verify the model results with air quality measurements at long-range stations.

Collecting air pollutants emission inventory of all parties, modeling inventory data for EMEP region and verifying the model results with air quality measurements at long-range stations are aimed with the "Protocol for the Long-Term Financing of the Cooperation Program for the Monitoring and Evaluation of the Long-Range Transport of Air Pollutants in Europe (EMEP) Protocol" to which our country became a party on 20.12.1985.

Graph 6 - Emission Totals of SO_2, NMVOC, NH_3, CO, and PM_{10} for 1990-2018. (Ministry of Environment and Urbanization, 2020)



When the status of the emissions between 1990-2018 covered by the reporting for 2020 in Graph 6 is examined; it is seen that there has been a serious decrease in combustion-related pollutants in the last year. This situation was caused by the reduction in fuel consumption in power plants and the updated emission factors due to changing technologies. Compared to 1990, it is seen that there was an increase in NO_X emissions the most (200%), followed by a decrease in PM_{10} (16%) and CO (22%) emissions, followed by SO_2 (46%), NH_3 (23%) NMVOC (21%) emissions.

When the emissions are analyzed compared to 2017; it is seen that NH_3 emissions increased by 9%, SO_2emissions increased by 4%, and CO, PM_{10}, NMVOC, and NO_X emissions decreased by 22%, 16%, 2%, and 1%, respectively. The emission changes, together with the time series, compared to the previous year are included in Table 30.

Table 30 - Emission Trends for SO_2, NO_x, NMVOC, NH_3, CO and PM_{10} (Ministry of Environment and Urbanization, 2020)

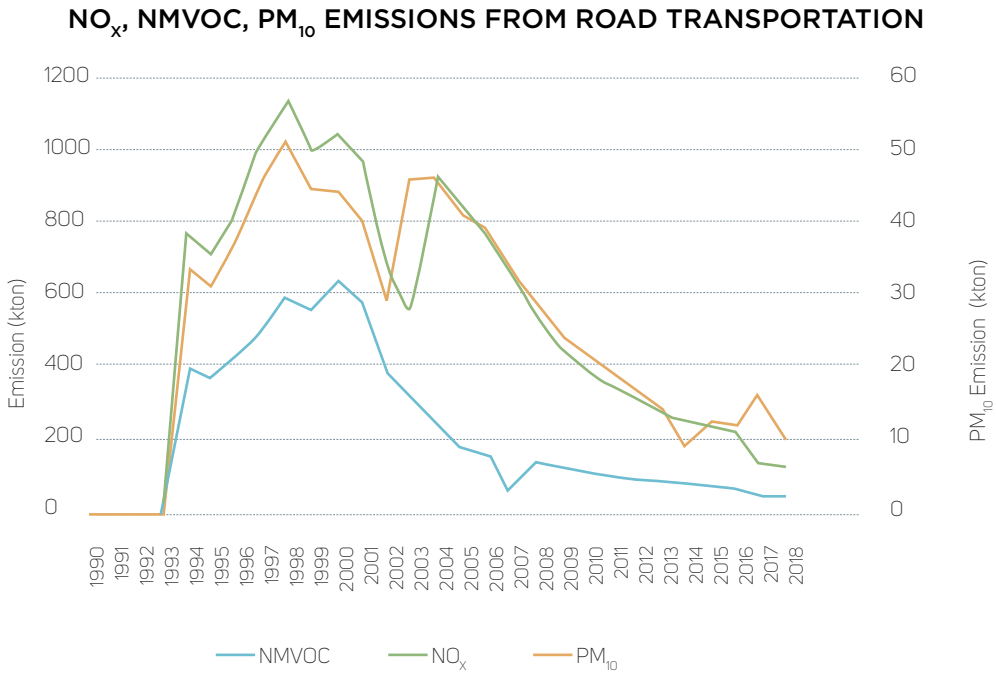
Change (%)	SO_2	NO_X	NMVOC	NH_3	CO	PM_{10}
Trend (1990-2018)	**46**	**202**	**21**	**23**	**-22**	**-16**
Trend (2017-2018)	4	-1	-2	9	-25	-16

From 2020 national emissions; SO_2 emissions were induced 9% by domestic heating and 70.4% by electric power plants. NO_x emissions were induced 45.7% by electric power plants. 21.7% of NMVOC emissions originated from the livestock sector. The main source of NH_3 emissions is fertilizer management.

A.1.1. Air Pollutants from Transportation

Another important sector included in National Air Pollutants Emission Inventory is transportation. Emissions resulting from transportations are calculated separately for road, sea, air, and railway transports. The Graph below shows the totals of road transport emissions calculated nationally. When the emission status of 1994-2020 is analyzed, the reduction in vehicle emissions stands out with the renewed engine technologies.

Graph 7 - Total road transport emissions
(Ministry of Environment and Urbanization, 2020)



A.2. Measurement Stations

A.2.1. Air Quality of the Cities in Turkey

Air pollution is observed in some city centers of Turkey, especially in the winter season, depending on the meteorological conditions. As a result of the use of natural gas and quality fuels in heating, there has been a decrease in air pollution, especially in big cities compared to the 1990s.

Air quality measurement stations have been established in 81 provinces to monitor air quality throughout our country by the Ministry of Environment and Urbanization. The number of stations included in the National Air Quality Monitoring Network, which started with 35 stations in 2005, has reached 355 in total as of July 2020.

The data obtained from the measurement stations are published simultaneously at the official website of Continuous Monitoring Center sim.csb.gov.tr and that of Ministry of Environment and Urbanization www.havaizleme.gov.tr. The Ministry of Environment and Urbanization publishes the monitoring results on the website www.havaizleme.gov.tr to facilitate public access to information on air quality. The National Air Quality Index (expressed as Good, Medium, Sensitive, Unhealthy, Bad, Dangerous) has been established by the Ministry of Environment and Urbanization to enable the public to understand the issue better.

Air quality limit values have been reduced gradually since 2008 throughout Turkey to improve air quality under the EU legislation harmonization process and full compliance with EU limit values for particulate matter and sulfur dioxide parameters has been achieved as of 2019.

Besides, 8 Regional Clean Air Centers (RCAC) have been established across the country to carry out air quality monitoring activities effectively, and the list of stations affiliated to RCACs is included in Table 31.

Table 31 - Air Quality Measurement Stations
(Ministry of Environment and Urbanization, 2020)

Clean Air Centers	Affiliated Provinces	Number of Affiliated Provinces	Present Station		Additional	Total
			Ministry	* Other		
İstanbul (THE MARMARA)	İstanbul, Bursa, Kocaeli, Sakarya, Çanakkale, Balıkesir, Yalova, Bilecik, Tekirdağ, Edirne, Kırklareli	11	62	30	0	92
İzmir (AEGEAN)	İzmir, Manisa, Uşak, Denizli, Aydın, Muğla	6	47	7	0	54
Konya (SOUTH CENTRAL ANATOLIA)	Konya, Isparta, Burdur, Antalya, Karaman, Niğde, Aksaray, Afyonkarahisar, Nevşehir, Kayseri	10	37	3	0	40
Ankara (NORTH CENTRAL ANATOLIA)	Ankara, Kütahya, Eskişehir, Kırşehir, Kırıkkale, Yozgat, Çankırı, Kastamonu, Karabük, Bartın, Zonguldak, Düzce, Bolu	13	51	10	0	61
Adana (MEDITERRANEAN)	Adana, Mersin, Kahramanmaraş, Kilis, Gaziantep, Hatay, Osmaniye	7	28	0	5	33
Samsun (CENTRAL BLACK SEA)	Samsun, Sinop, Amasya, Çorum, Tokat, Sivas, Ordu, Giresun	8	29	1	0	30
Diyarbakır (SOUTHEASTERN ANATOLIA)	Diyarbakır, Urfa, Mardin, Şırnak, Hakkari, Siirt, Van, Bitlis, Batman, Muş, Bingöl, Tunceli, Elazığ, Malatya, Adıyaman	15	15	0	0	15
Erzurum (EASTERN ANATOLIA)	Erzurum, Ağrı, Iğdır, Kars, Ardahan, Artvin, Rize, Trabzon, Gümüşhane, Erzincan, Bayburt	11	27	0	0	27
CAPITAL	Ankara	0	3	0	0	3
TOPLAM		**81**	**299**	**51**	**5**	**355**

* Stations belonging to municipalities and industrial organizations.

PM_{10} data and SO_2 data measured between 2015-2019 from stations across the country are included in Table 32, and Table 33, respectively.

Map 9 – Air Quality Stations Website Homepage
(www.havaizleme.gov.tr; sim.csb.gov.tr, 2020)

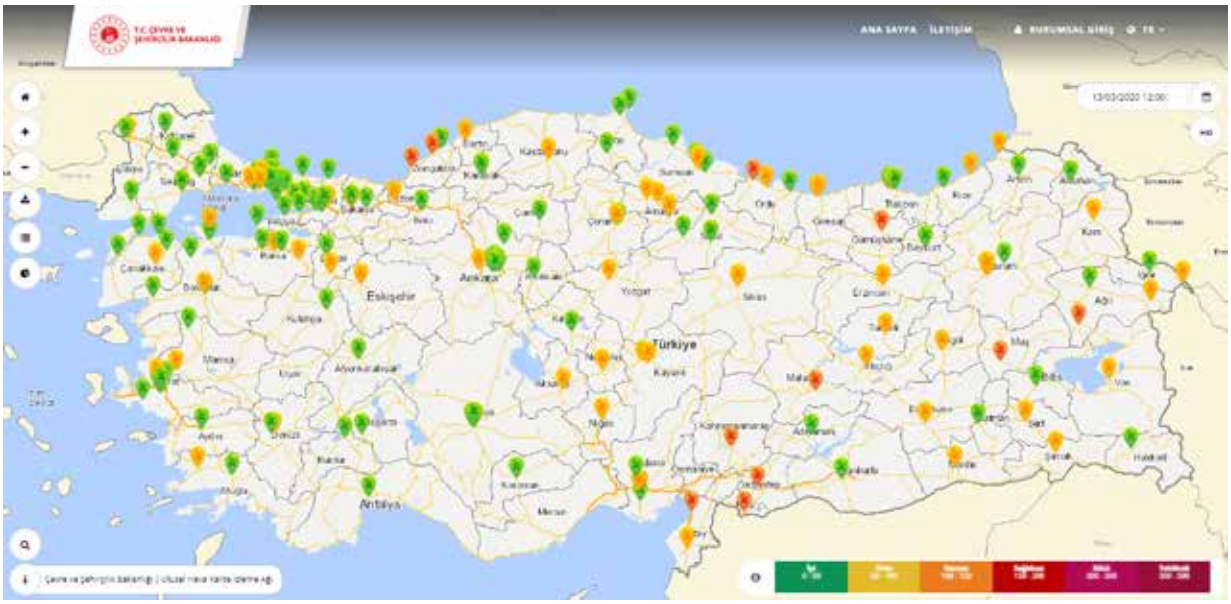


Table 32 - Annual Averages of Particulate Matter (PM_{10}) Obtained from Measurement Stations in Provincial and District Centers
(Ministry of Environment and Urbanization, 2020)

Particulate Matter (PM_{10}) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Adana - Çatalan	36	28	28	30	20
Adana - Doğankent	46	19	43	61	14
Adana - Meteoroloji	69	58	88	96	83
Adana - Valilik	80	56	62	61	52
Adıyaman	53	51	51	46	53
Afyon	89	82	82	68	24
Ağrı	55	43	59	56	85
Ağrı - Doğubeyazıt	-	107	96	62	69
Ağrı - Patnos	-	68	49	55	93
Aksaray	63	60	68	37	36
Amasya	28	30	29	25	39
Amasya-Merzifon	40	46	50	41	55
Amasya-Suluova	78	56	60	50	52
Amasya-Şehzade	77	85	84	69	69
Ankara - Bahçelievler	52	60	53	47	37

Particulate Matter (PM_{10}) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Ankara - Cebeci	64	65	61	47	81
Ankara - Demetevler	56	62	62	61	51
Ankara - Dikmen	65	67	61	64	33
Ankara - Kayas	68	80	100	60	45
Ankara - Keçiören	48	56	68	61	43
Ankara - Sıhhiye	67	72	85	64	50
Ankara - Sincan	43	51	61	65	44
Antalya	48	53	51	48	39
Ardahan	34	23	25	17	40
Artvin	34	19	24	23	21
Artvin - Hopa	-	14	15	26	20
Aydın	66	63	45	35	37
Balıkesir	44	42	56	44	34
Balıkesir - Bandırma-RCAC	51	44	52	49	43
Balıkesir - Erdek-RCAC	-	-	-	42	24
Bartın	48	57	51	43	49
Batman	92	68	63	46	44
Bayburt	46	43	43	44	33
Bilecik	43	47	39	45	38
Bilecik - Bozüyük-RCAC	57	55	61	63	59
Bingöl	26	23	43	44	39
Bitlis	25	29	27	31	21
Bolu	102	34	31	33	59
Burdur	64	57	69	64	44
Bursa	105	93	99	98	84
Bursa - Beyazıt Cad.-RCAC	79	71	81	79	59
Bursa - İnegöl-RCAC	80	69	65	42	54
Bursa - Kestel-RCAC	67	68	68	-	43
Çanakkale	27	24	26	39	42
Çanakkale - Can-RCAC	71	64	66	54	55
Çankırı	19	47	54	39	35
Çorum	52	60	61	51	44
Çorum - Bahabey	71	82	77	59	73
Çorum - Mimar Sinan	37	56	65	62	78
Denizli - Bayramyeri	84	90	75	74	59
Denizli - Merkezefendi	51	63	64	62	51
Diyarbakır	65	53	49	41	39
Düzce	95	92	79	57	66
Edirne	55	46	46	43	47

Particulate Matter (PM_{10}) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Edirne - Keşan-RCAC	87	69	70	53	50
Elazığ	37	42	61	60	58
Erzincan	70	84	78	73	69
Erzincan - Trafik	-	64	58	54	41
Erzurum	39	51	44	41	-
Erzurum - Aziziye	-	68	77	51	60
Erzurum - Palandöken	-	23	22	28	30
Erzurum - Pasinler	-	21	25	20	25
Erzurum - Taşhan	-	81	84	66	74
Eskişehir	24	26	27	25	61
Gaziantep	60	71	54	41	48
Giresun	48	43	46	47	49
Giresun - Gemilerçekeği	46	41	36	28	36
Gümüşhane	55	50	48	40	44
Hakkari	94	78	74	22	15
Hatay - Antakya	80	79	73	28	13
Hatay - İskenderun)	49	34	41	27	13
Iğdır	121	106	128	110	118
Iğdır - Aralık	-	41	49	48	55
Isparta	61	56	56	64	47
Mersin	65	53	72	85	83
İstanbul - Aksaray	55	65	60	56	48
İstanbul - Alibeyköy	45	59	56	59	71
İstanbul - Avcılar	-	62	36	27	28
İstanbul - Besiktaş	47	47	42	39	34
İstanbul - Büyükada	-	30	26	24	22
İstanbul - Çatladıkapı	-	51	28	29	32
İstanbul - Esenler	56	52	51	52	39
İstanbul - Esenyurt-RCAC	116	74	76	66	61
İstanbul - Göztepe	-	66	70	79	54
İstanbul - Kadıköy	53	52	48	52	36
İstanbul - Kâğıthane	72	-	101	-	72
İstanbul - Kandilli	-	-	-	5	15
İstanbul - Kandilli-RCAC	46	43	40	37	34
İstanbul - Kartal	46	45	51	63	47
İstanbul - Kumköy	-	-	23	18	19
İstanbul - Maslak	-	46	31	41	35
İstanbul - Mecidiyeköy-RCAC	52	52	48	56	64
İstanbul - Sarıyer	54	38	26	28	16

Particulate Matter (PM_{10}) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
İstanbul - Selimiye	-	67	44	36	31
İstanbul - Silivri-RCAC	40	36	37	35	27
İstanbul - Sultanbeyli-RCAC	-	-	-	62	34
İstanbul - Sultangazi-RCAC	-	-	-	104	58
İstanbul - Sile-RCAC	26	25	30	27	25
İstanbul - Şirinevler-RCAC	57	24	57	50	45
İstanbul - Ümraniye	37	43	49	39	33
İstanbul - Ümraniye-RCAC	54	56	39	42	29
İstanbul - Üsküdar	10	46	40	30	28
İstanbul - Üsküdar-RCAC	40	37	38	36	32
İstanbul - Yenibosna	63	60	50	52	35
İzmir - Alsancak	32	42	38	38	31
İzmir - Bayraklı	57	54	50	51	45
İzmir - Bornova	46	44	45	50	41
İzmir - Çiğli	40	35	34	36	33
İzmir - Gaziemir	33	51	60	46	36
İzmir - Güzelyalı	41	39	37	36	41
İzmir - Karşıyaka	29	20	48	78	27
İzmir - Şirinyer	46	46	42	41	32
Kahramanmaraş	67	54	60	53	63
Kahramanmaraş- Elbistan	86	72	116	115	87
Karabük	75	35	39	58	35
Karaman	85	77	76	34	34
Kars-İstasyon Mahallesi	47	61	59	41	45
Kars - Trafik	-	50	63	52	65
Kastamonu	28	49	50	50	56
Kayseri - 3 (Hürriyet)	98	103	79	64	58
Kayseri - 2 (Melikgazi)	67	61	57	59	50
Kayseri - 1 (OSB)	76	74	66	60	66
Kırıkkale	26	27	26	28	50
Kırklareli	49	74	61	55	47
Kırklareli - Limanköy-RCAC	25	21	27	28	29
Kırklareli - Lüleburgaz-RCAC	43	35	38	33	31
Kırşehir	33	26	23	24	31
Kilis	40	42	42	43	52
Kocaeli	57	56	59	62	55
Kocaeli - Alikahya-RCAC	50	52	52	51	48
Kocaeli - Dilovası	73	55	56	56	46
Kocaeli - Gölcük-RCAC	-	-	-	51	35

Particulate Matter (PM_{10}) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Kocaeli - Izmit-RCAC	57	56	74	57	48
Kocaeli - Kandıra-RCAC	42	52	49	25	21
Kocaeli - Körfez-RCAC	50	42	49	55	43
Kocaeli - OSB	27	32	27	22	38
Kocaeli - Yeniköy-RCAC	41	36	40	38	35
Konya - Meram	59	51	68	46	39
Konya - Selçuklu	51	50	61	54	52
Konya-Karatay-Belediye	76	58	85	57	47
Konya-Selçuklu-Belediye	40	37	52	41	49
Kütahya	67	89	65	78	59
Malatya	44	37	53	57	63
Manisa	89	85	77	96	65
Manisa - Soma	83	92	78	70	60
Mardin	80	63	63	61	41
Muğla - Musluhittin	86	79	67	74	55
Muğla - Yatağan	79	71	75	-	-
Muş	132	127	79	56	137
Nevşehir	45	46	48	41	25
Niğde	75	73	81	80	50
Ordu - Fatsa	50	47	56	39	47
Ordu - Karşıyaka	50	42	45	39	45
Ordu-Stadyum	43	45	51	45	43
Ordu - Ünye	60	78	57	61	77
Osmaniye	68	67	72	68	58
Rize	29	25	29	28	31
Rize - Ardeşen	*	14	12	25	23
Sakarya	73	62	63	58	48
Sakarya - Merkez-RCAC	62	63	70	67	55
Sakarya - Ozanlar-RCAC	-	-	-	56	37
Samsun - Atakum	44	39	40	38	36
Samsun - Bafra	22	54	56	45	40
Samsun - Canik	48	54	63	47	58
Samsun - İlkadım Hastane	78	64	59	57	46
Samsun - Tekkeköy	58	55	78	51	44
Samsun - Yüzüncüyıl	61	65	69	62	57
Siirt	103	91	65	52	43
Sinop	48	45	50	40	39
Sinop - Boyabat	65	79	68	53	61
Sinop-Erfelek		-	15	17	13

Particulate Matter (PM_{10}) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Sivas - Başöğretmen	45	59	64	52	47
Sivas - İstasyon Kavşağı	78	72	79	64	60
Sivas - Meteoroloji	36	47	53	55	47
Şanlıurfa	45	34	73	58	44
Şırnak	35	20	45	107	81
Tekirdağ	77	71	58	34	27
Tekirdağ - Çerkezköy-RCAC	40	41	42	41	40
Tekirdağ - Merkez-RCAC	83	102	81	51	38
Tokat	44	42	45	36	39
Tokat - Erbaa	71	80	87	62	53
Tokat-Meydan	34	64	69	54	55
Tokat - Turhal	52	51	74	48	62
Trabzon - Akçaabat	-	41	36	35	38
Trabzon - Beşirli	-	53	46	38	45
Trabzon - Fatih	-	55	40	39	50
Trabzon - Meydan	64	58	62	42	33
Trabzon - Uzungöl	-	11	23	17	-
Trabzon - Valilik	54	48	23	16	28
Tunceli	22	19	26	21	42
Uşak	63	70	65	-	-
Van	39	37	41	43	41
Yalova	36	65	69	49	39
Yalova - Armutlu-RCAC	30	26	26	15	28
Yozgat	42	49	26	47	44
Zonguldak	69	59	28	30	33
Zonguldak - Karadeniz Ereğli	69	59	29	49	79

Table 33 - Annual Averages of Sulfur Dioxide (SO_2) Concentrations Obtained from the Stations Measured in Provincial and District Centers
(Ministry of Environment and Urbanization, 2020)

Sulfur Dioxide (SO_2) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Adana - Çatalan	2	1	2	5	2
Adana - Doğankent	8	8	9	26	3
Adana - Meteoroloji	5	3	3	8	3
Adana - Valilik	12	11	5	6	13
Adıyaman	12	10	3	5	15
Afyonkarahisar	31	20	23	15	7
Ağrı	7	19	21	11	8

Sulfur Dioxide (SO_2) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Ağrı - Doğubeyazıt	-	22	38	31	11
Ağrı - Patnos	-	19	22	16	23
Aksaray	10	7	7	6	14
Amasya	11	10	10	8	7
Amasya-Merzifon	77	35	10	7	8
Amasya-Suluova	138	72	40	18	17
Ankara - Bahçelievler	10	8	8	5	5
Ankara - Cebeci	9	11	8	6	10
Ankara - Demetevler	11	18	9	8	6
Ankara - Dikmen	10	9	6	6	-
Ankara - Kayaş	6	9	10	16	8
Ankara - Keçiören	6	8	6	5	5
Ankara - Sıhhiye	9	10	8	6	6
Ankara - Sincan	9	18	8	7	5
Antalya	8	4	4	4	5
Ardahan	14	15	14	15	25
Artvin	9	7	9	9	7
Aydın	21	11	9	12	7
Balıkesir	13	7	8	8	7
Balıkesir - Bandırma-RCAC	6	10	7	5	7
Balıkesir - Erdek-RCAC	5	10	8	5	8
Bartın	12	10	10	10	10
Batman	7	4	8	6	6
Bayburt	4	7	6	4	9
Bilecik	8	7	8	5	5
Bilecik - Bozüyük-RCAC	8	10	9	6	5
Bingöl	7	5	9	8	7
Bitlis	10	17	39	36	31
Bolu	23	13	12	9	10
Burdur	15	7	9	14	11
Bursa	10	6	6	4	6
Bursa - Beyazıt Cad.-RCAC	14	11	11	9	10
Bursa - İnegöl-RCAC	17	23	16	10	11
Bursa - Kestel-RCAC	25	24	19	-	18
Bursa - Kültür Park-RCAC	9	7	8	6	8
Bursa - Uludağ Üniv.-RCAC	5	7	5	4	5
Çanakkale	10	9	11	11	11
Çanakkale - Can-RCAC	86	57	23	11	23

Sulfur Dioxide (SO_2) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Çanakkale - Lapseki-RCAC	8	10	9	8	10
Çankırı	20	6	8	9	21
Çorum	21	13	12	8	12
Çorum - Mimar Sinan	76	28	40	18	23
Denizli - Bayramyeri	31	24	19	20	19
Denizli - Merkezefendi	17	9	9	10	15
Diyarbakır	9	7	8	6	7
Düzce	7	10	7	9	4
Edirne	25	25	27	12	6
Edirne - Karaağaç-RCAC	7	17	6	6	9
Edirne - Keşan-RCAC	321	257	167	137	67
Elazığ	13	5	6	7	6
Erzincan	13	10	10	7	10
Erzincan - Trafik	-	25	15	10	11
Erzurum	13	11	13	12	10
Erzurum - Aziziye	-	21	19	13	17
Erzurum - Palandöken	-	11	8	6	6
Erzurum - Pasinler	-	10	9	8	3
Eskişehir	4	4	4	8	14
Gaziantep	11	8	10	7	8
Giresun	8	5	7	7	5
Giresun - Gemilerçekeği	11	17	13	8	20
Gümüşhane	10	7	6	6	6
Hakkari	56	40	38	29	58
Hatay - Antakya	10	9	10	11	9
Hatay İskenderun	19	16	13	15	15
Iğdır	8	9	10	12	13
Iğdır - Aralık	-	5	11	7	5
Isparta	15	13	14	11	10
Mersin	6	3	5	8	4
İstanbul - Aksaray	10	12	8	5	4
İstanbul - Alibeyköy	4	4	3	3	2
İstanbul - Avcılar	-	15	5	6	-
İstanbul - Başakşehir-RCAC	5	13	8	3	5
İstanbul - Besiktaş	4	6	4	8	5
İstanbul - Esenler	5	6	5	13	3
İstanbul - Esenyurt-RCAC	5	6	8	6	7
İstanbul - Kadıköy	11	6	3	5	4

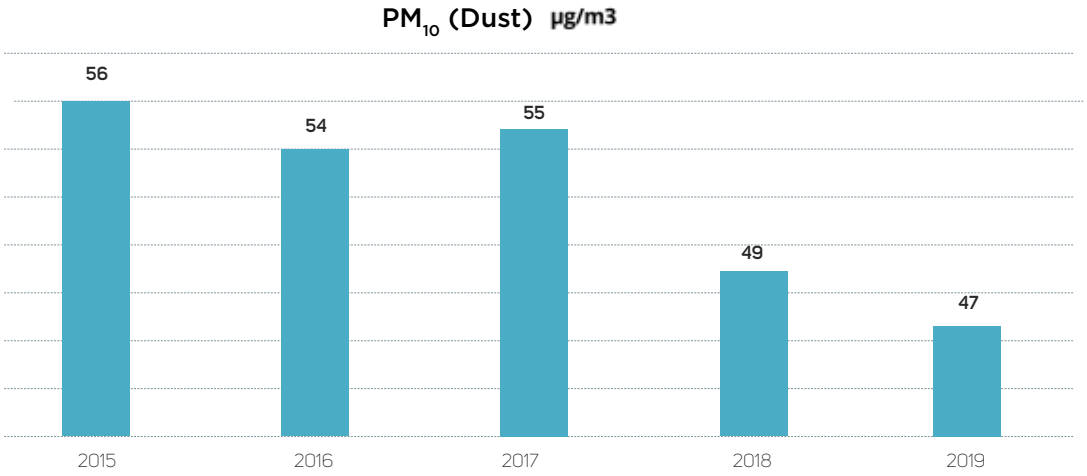
Sulfur Dioxide (SO_2) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
İstanbul - Kâğıthane	15	3	3	7	3
İstanbul - Kâğıthane-RCAC	6	14	8	4	5
İstanbul - Kandilli	-	-		-	-
İstanbul - Kandilli-RCAC	9	29	14	10	11
İstanbul - Kartal	7	-	3	4	3
İstanbul - Maslak	-	8	14	-	2
İstanbul - Sarıyer	8	10	10	8	-
İstanbul - Silivri-RCAC	-	-		-	3
İstanbul - Sultanbeyli-RCAC	5	7	6	4	6
İstanbul - Sultangazi-RCAC	4	8	3	3	4
İstanbul – Şile-RCAC	-	-	-	-	4
İstanbul - Şirinevler-RCAC	6	15	5	3	7
İstanbul - Ümraniye	6	10	9	11	3
İstanbul - Ümraniye-RCAC	5	17	6	5	7
İstanbul - Üsküdar	38	-	5	6	3
İstanbul - Yenibosna	7	6	5	9	-
İzmir - Alsancak	7	7	12	9	13
İzmir - Bayraklı	5	17	8	6	7
İzmir - Bornova	18	7	9	8	9
İzmir - Çiğli	11	10	13	15	14
İzmir - Gaziemir	14	11	8	19	12
İzmir - Güzelyalı	7	9	17	14	12
İzmir - Karşıyaka	9	10	14	-	11
İzmir - Şirinyer	11	16	12	11	8
Kahramanmaraş	20	18	20	23	23
Kahramanmaraş - Elbistan	26	11	18	12	10
Karabük	30	18	19	23	12
Karaman	19	13	13	8	11
Kars-İstasyon Mahallesi	21	31	23	15	14
Kastamonu	7	4	4	6	7
Kayseri - 3 (Hürriyet)	8	9	10	7	10
Kayseri - 2 (Melikgazi)	7	8	7	9	11
Kayseri - 1 (OSB)	5	12	13	9	12
Kırıkkale	16	17	16	19	15
Kırklareli	16	19	17	12	5
Kırklareli - Limanköy-RCAC	3	6	4	2	2
Kırklareli - Lüleburgaz-RCAC	22	23	12	11	7
Kırşehir	10	11	5	7	15

Sulfur Dioxide (SO_2) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Kilis	8	9	12	8	6
Kocaeli	5	7	6	2	5
Kocaeli - Alikahya-RCAC	10	15	12	7	5
Kocaeli - Dilovası	13	16	21	9	18
Kocaeli - Gölcük-RCAC	10	25	13	6	6
Kocaeli - Körfez-RCAC	14	31	18	8	7
Kocaeli - OSB	18	25	19	11	73
Kocaeli - Yeniköy-RCAC	7	16	10	6	4
Konya - Meram	10	14	19	6	15
Konya - Selçuklu	6	7	13	13	11
Konya-Karatay-Belediye	10	16	27	12	9
Konya-Selçuklu-Belediye	8	7	10	8	8
Kütahya	9	3	16	26	22
Malatya	12	8	7	9	11
Manisa	7	9	10	16	21
Manisa - Soma	106	95	92	69	72
Mardin	11	14	10	11	14
Muğla - Musluhittin	24	21	15	28	20
Muğla - Yatağan	26	14	5	21	-
Muş	23	22	21	11	9
Nevşehir	13	13	12	7	16
Niğde	7	9	7	5	9
Ordu - Fatsa	30	51	5	5	11
Ordu - Karşıyaka	19	22	28	10	10
Ordu-Stadyum	11	8	23	8	14
Ordu - Ünye	13	21	19	7	11
Osmaniye	23	12	16	21	6
Rize	5	3	4	4	6
Rize - Ardeşen	-	4	3	4	3
Sakarya	14	14	15	8	8
Sakarya - Ozanlar-RCAC	12	22	13	8	5
Samsun - Atakum	20	12	10	7	14
Samsun - Bafra	89	18	16	5	8
Samsun - Canik	89	22	23	9	14
Samsun - İlkadım Hastane	7	5	7	22	11
Samsun - Tekkeköy	19	25	17	9	14
Siirt	19	18	19	14	14
Sinop	11	7	16	20	11

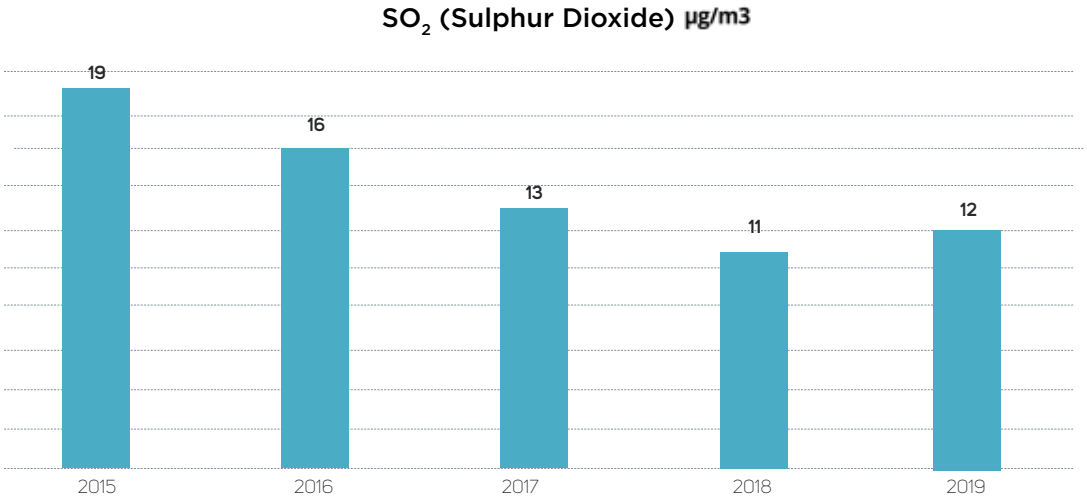
Sulfur Dioxide (SO_2) Averages (µg/m³)					
Station Name	2015	2016	2017	2018	2019
Sinop - Boyabat	15	27	24	16	14
Sivas - Başöğretmen	34	30	20	13	17
Sivas - Meteoroloji	76	8	15	12	9
Şanlıurfa	8	13	17	18	34
Şırnak	119	22	3	8	13
Tekirdağ	24	28	26	14	16
Tekirdağ - Çerkezköy-RCAC	16	25	18	12	16
Tekirdağ - Merkez-RCAC	44	45	20	17	18
Tokat	10	5	6	7	7
Tokat - Erbaa	15	23	17	8	16
Tokat - Turhal	18	32	19	9	10
Trabzon - Akçaabat		18	6	6	26
Trabzon - Fatih		11	8	5	5
Trabzon - Meydan	14	13	14	7	26
Trabzon - Uzungöl		5	2	2	3
Trabzon - Valilik	18	11	8	9	-
Tunceli	5	5	9	10	8
Uşak	15	7	6	-	-
Van	12	15	15	13	17
Yalova	7	3	3	4	5
Yalova - Altınova-RCAC	7	13	8	6	11
Yalova - Armutlu-RCAC	6	7	7	6	5
Yozgat	45	34	19	16	23
Zonguldak	17	11	17	21	13
Zonguldak - Karadeniz Ereğli	17	3	4	6	3

According to the results of measurements made by the air quality measurement stations across Turkey between 2015 and 2019; an improvement of 16% was achieved in PM_{10} parameter and 37% in the SO_2 parameter.

Graph 8 - Annual changes in PM_{10} emissions by years.
(Ministry of Environment and Urbanization, 2020)



Graph 9 - Annual changes in Sulphur Dioxide emissions by years
(Ministry of Environment and Urbanization, 2020)



A.2.2. Air Quality in Forest Areas of Turkey

Air pollution in forest lands in our country is measured for 4 parameters, and the average of the measurement results made between 2017-2019 are given in the tables below.

Table 34 - Annual Averages of Sulfur Dioxide (SO_2) Concentrations Obtained from the Stations Measured in Forest Areas

(General Directorate of Forestry, 2020)

Monitoring Station No (Observation Area No)	General Directorate of Forestry (Province)	SO_2 averages (µg/m³)		
		2017	2018	2019
4	Ankara	2.38	1.10	1.24
6	Bolu	2.16	1.42	1.36
8	Balıkesir	4.56	3.01	3.34
10	Antalya	2.25	1.38	1.28
11	Antalya		1.22	1.30
12	İzmir	4.47	4.96	6.26
17	Giresun	5.13	1.45	1.41
18	Kars	4.41	1.09	1.34
22	Trabzon	6.89	1.04	1.30
23	Sinop	2.41	1.12	1.28
27	Mersin	2.14	1.55	1.32
29	Kahramanmaraş	9.59	11.37	11.65
30	Kırklareli	4.37	1.59	1.87
34	Konya	2.45	1.10	1.39
50	Kastamonu	2.38	1.13	1.34
51	İzmir	3.48	2.90	3.31
52	Eskişehir	3.57	2.46	3.05
54	Kocaeli	3.10	2.08	2.73

Table 35 - Annual averages of Ammonia (NH_3) concentrations obtained from stations where measurements are made in forest areas

(General Directorate of Forestry, 2020)

Monitoring Station No (Observation Area No)	General Directorate of Forestry (Province)	NH_3 averages (µg/m³)		
		2017	2018	2019
4	Ankara	3.98	6.28	3.68
6	Bolu	3.13	5.69	4.11
8	Balıkesir	3.46	5.66	3.32
10	Antalya	6.24	7.08	4.10
11	Antalya	0.00	5.39	4.18
12	İzmir	4.54	9.03	5.29
17	Giresun	2.92	6.13	4.72
18	Kars	3.74	4.83	4.51
22	Trabzon	3.75	5.27	6.83
23	Sinop	2.75	6.06	4.12
27	Mersin	4.75	8.90	5.70
29	Kahramanmaraş	4.37	7.43	5.76

Monitoring Station No (Observation Area No)	General Directorate of Forestry (Province)	NH_3 averages (µg/m³)		
		2017	2018	2019
30	Kırklareli	6.41	5.51	4.96
34	Konya	2.86	4.90	3.90
50	Kastamonu	4.44	6.06	3.44
51	İzmir	4.07	5.61	4.05
52	Eskişehir	3.74	6.46	4.32
54	Kocaeli	3.16	6.70	4.29

Table 36 - Annual Averages of Nitrogen dioxide (NO_2) Concentrations Obtained from Stations Measured in Forest Areas

(General Directorate of Forestry, 2020)

Monitoring Station No (Observation Area No)	General Directorate of Forestry (Province)	NO_2 averages (µg/m³)		
		2017	2018	2019
4	Ankara	3.64	2.94	2.59
6	Bolu	2.78	2.51	2.52
8	Balıkesir	2.42	3.82	2.49
10	Antalya	3.32	4.42	3.57
11	Antalya		1.90	1.47
12	İzmir	18.47	11.90	14.46
17	Giresun	1.42	1.95	1.22
18	Kars	3.59	2.31	2.19
22	Trabzon	3.98	2.30	4.01
23	Sinop	3.03	1.84	1.60
27	Mersin	2.51	2.70	1.76
29	Kahramanmaraş	12.39	7.79	9.04
30	Kırklareli	2.15	2.79	2.86
34	Konya	1.76	1.59	1.29
50	Kastamonu	2.64	3.10	2.02
51	İzmir	6.10	2.50	2.63
52	Eskişehir	2.84	2.02	2.11
54	Kocaeli	4.93	3.46	3.47

Table 37 - Annual Averages of Ozone (O_3) Concentrations Obtained from Stations Measured in Forest Areas

(General Directorate of Forestry, 2020)

Monitoring Station No (Observation Area No)	General Directorate of Forestry (Province)	O_3 averages (ppb*)		
		2017	2018	2019
4	Ankara	26.65	36.72	36.14
6	Bolu	30.78	37.08	37.22
8	Balıkesir	27.14	54.39	37.01
10	Antalya	19.89	43.81	31.93
11	Antalya		27.28	37.29
12	İzmir	28.92	43.72	46.67
17	Giresun	38.49	41.51	41.79
18	Kars	43.24	45.34	55.43
22	Trabzon	32.34	28.09	33.82
23	Sinop	31.75	35.45	41.92
27	Mersin	40.60	43.73	50.60
29	Kahramanmaraş	28.58	41.83	50.89
30	Kırklareli	36.70	43.15	42.85
34	Konya	31.74	35.86	40.46
50	Kastamonu	26.94	31.88	38.65
51	İzmir	39.12	40.77	49.65
52	Eskişehir	38.96	45.01	48.96
54	Kocaeli	39.08	44.31	50.17

A.2.3. Continuous Emission Monitoring Systems

Continuous monitoring of emissions from chimneys of industrial facilities with high pollutant characteristics is carried out in accordance with the legislation issued by the Ministry of Environment and Urbanization (MoEU).

Table 38 - Number of Facilities and Chimneys with CEMS according to the province throughout Turkey

(Ministry of Environment and Urbanization, 2020)

Province	Number of Facilities	Number of Chimneys	Province	Number of Facilities	Number of Chimneys
Adana	11	27	Kars	1	1
Adıyaman	1	1	Kastamonu	2	8
Afyonkarahisar	4	5	Kayseri	3	7
Ağrı	1	1	Kırıkkale	3	10
Amasya	1	4	Kırklareli	14	25
Ankara	14	26	Kırşehir	1	1
Antalya	1	7	Kocaeli	37	114
Aydın	3	4	Konya	7	11
Balıkesir	10	14	Kütahya	7	15
Bartın	2	3	Malatya	2	2
Batman	1	2	Manisa	4	12
Bilecik	2	3	Mardin	1	2
Bolu	1	2	Mersin	7	18
Burdur	3	5	Muğla	4	9
Bursa	23	57	Muş	2	4
Çanakkale	4	16	Nevşehir	1	1
Çankırı	1	1	Niğde	2	4
Çorum	2	3	Ordu	2	2
Denizli	11	18	Sakarya	6	10
Diyarbakır	1	1	Samsun	10	34
Edirne	1	1	Siirt	1	3
Elazığ	4	6	Sivas	1	3
Erzincan	1	3	Şanlıurfa	1	1
Erzurum	1	2	Şırnak	1	8
Eskişehir	6	10	Tekirdağ	19	28
Gaziantep	2	2	Tokat	2	4
Gümüşhane	1	2	Trabzon	1	1
Hatay	6	15	Uşak	2	4
Isparta	2	5	Van	2	3
İstanbul	4	15	Yalova	2	6
İzmir	19	56	Yozgat	3	5
Kahramanmaraş	6	10	Zonguldak	4	18
Karabük	2	12			
			Total	308	714

Continuous Emission Measurement Systems have been established, within the scope of the Continuous Emission Measurement Systems (CEMS) Communiqué published in the Official Gazette No. 12 October 28082 and the Continuous Emission Measurement Systems (CEMS) Online Monitoring Circular, to monitor air pollution from industrial throughout Turkey.

As of the end of 2019, monitoring systems were installed in 714 chimneys of 308 facilities (Table 38), and measurement data are monitored online by the Ministry of Environment and Urbanization.

Furthermore, 15 laboratories that can carry out the calibration studies of Continuous Emission Measurement Systems within the scope of monitoring emissions originating from the stacks of industrial facilities have been authorized by the MoEU.

Within the scope of the Standardization, Integration, and Modernization of Measurement Systems (CMC PHASE II) Project, which will end at the end of 2020, all CEMS chimneys in our country will be monitored more effectively; follow-ups will contribute positively to human and environmental health.

A.3. Exhaust Gas Emission Control

The number of motor vehicles in our country has exceeded 23 million due to the increases in recent years. By law on Exhaust Gas Emission Control has been published to protect living things and the environment from the effects of air pollution caused by exhaust gases caused by motor vehicles in traffic, to reduce exhaust gas pollutants, to control by making measurements, and to determine the procedures and principles for implementation.

"Exhaust Gas Emission Measurement Tracking System" has been put into practice by the Ministry of Environment and Urbanization as of 01/01/2018 to ensure the monitoring of exhaust gas emission measurements and to perform the measurements more effectively.

According to the data of the Tracking System, the number of measurements in 2018 and 2019 by provinces and the number of measurements by months are given below.

Table 39 - Number of Measurements by Months in 2018 and 2019 According to Exhaust Gas Emission Measurement Monitoring System Data
(Ministry of Environment and Urbanization, 2020)

MONTH	2018	2019
January	623,721	610,617
February	573,554	594,376
March	708,301	709,513
April	698,236	736,030
May	742,210	826,566
June	750,086	673,167
July	771,958	827,031
August	651,737	716,093
September	702,454	753,741
October	756,292	766,382
November	802,033	818,459
December	829,506	914,742
TOTAL	**8,610,088**	**8,946,717**

Table 40 - Number of Measurements by Provinces in 2018 and 2019 According to Exhaust Gas Emission Measurement Monitoring System Data
(Ministry of Environment and Urbanization, 2020)

PROVINCE	2018	2019	PROVINCE	2018	2019
Adana	224,961	229,293	Kars	16,369	17,579
Adıyaman	46,685	49,959	Kastamonu	45,461	44,099
Afyonkarahisar	74,219	78,730	Kayseri	165,419	170,343
Aksaray	42,523	44,866	Kırıkkale	51,242	50,157
Amasya	40,984	41,865	Kırklareli	40,346	40,900
Ankara	676,540	700,407	Kırşehir	28,504	29,655
Antalya	351,541	374,757	Kilis	12,994	14,017
Ardahan	5,940	6,402	Kocaeli	212,464	222,889
Artvin	19,676	20,837	Konya	273,795	284,169
Aydın	137,153	141,841	Kütahya	71,964	73,375
Ağrı	19,212	21,611	Malatya	73,378	75,999
Balıkesir	157,336	158,812	Manisa	168,696	174,140
Bartın	25,986	23,946	Mardin	53,708	55,157
Batman	35,557	37,704	Mersin	212,731	220,786
Bayburt	7,016	7,754	Muğla	160,142	168,109
Bilecik	27,795	26,781	Muş	18,040	20,391
Bingöl	14,175	15,618	Nevşehir	39,232	41,638
Bitlis	14,667	16,078	Niğde	39,901	41,353
Bolu	45,384	45,673	Ordu	74,973	77,847
Burdur	36,284	37,311	Osmaniye	60,389	62,760
Bursa	349,220	353,448	Rize	44,328	46,569
Denizli	143,940	149,765	Sakarya	123,190	123,254
Diyarbakır	88,406	93,620	Samsun	142,482	143,705
Düzce	42,459	43,590	Siirt	13,813	14,852
Edirne	55,410	54,757	Sinop	25,389	25,381
Elazığ	52,176	54,667	Sivas	68,106	70,321
Erzincan	24,500	25,016	Tekirdağ	107,576	111,933
Erzurum	53,049	55,315	Tokat	57,849	60,133
Eskişehir	106,494	108,731	Trabzon	95,474	101,468
Gaziantep	171,418	186,428	Tunceli	5,866	6,487
Giresun	49,762	51,047	Uşak	45,113	45,893
Gümüşhane	11,000	11,662	Van	69,595	71,732
Hakkari	12,302	13,291	Yalova	36,390	37,207
Hatay	160,724	167,447	Yozgat	40,613	42,169
Isparta	57,349	58,026	Zonguldak	63,805	60,926
Iğdır	15,504	16,840	Çanakkale	61,720	64,899
İstanbul	1,474,123	1,546,052	Çankırı	20,456	20,530

PROVINCE	2018	2019	PROVINCE	2018	2019
İzmir	492,821	519,164	**Çorum**	62,237	61,944
Kahramanmaraş	118,191	122,293	**Şanlıurfa**	132,964	147,184
Karabük	30,211	29,609	**Şırnak**	27,437	29,247
Karaman	33,244	34,507	**TOTAL**	8,610,088	8,946,717

A.4. Noise

Necessary legal and technical regulations on noise in our country are addressed under the by-laws and circulars put into effect by the Ministry of Environment and Urbanization.

The first legal regulation for the control of noise was made with Environmental Law No. 2872 in Turkey in 1983. Based on this Law, the first technical arrangements were made with the "By-Law on Noise Control" dated 1986. The said By-Law was harmonized with the EU Directive on Environmental Noise Management numbered 2002/49 / EC and was published under the name of ""By-Law on Environmental Noise Assessment and Management" in the Official Gazette no. 27601 dated June 4, 2010. The purpose of the by law is to ensure that the necessary measures are taken to ensure that the peace, tranquility, and physical and mental health of people are not impaired as a result of exposure to environmental noise and to control environmental vibration that may occur in very sensitive and sensitive structures.

Under the by law, requesting noise maps and action plans as an annex to the plan and predicting them upon the plan decisions are imposed as obligatory. Furthermore, due to the Spatial Plans Construction by law, it is stipulated that the development plans should be prepared by taking into account (if any) the strategic noise maps and action plans and the necessary measures should be taken in the plans.

Regarding the Strategic Noise Maps and Action Plans; MoEU is obliged to comment on noise maps and action plans prepared by institutions and organizations responsible for noise mapping.

Mayorships are obliged to "prepare separate noise maps for areas such as road, tramway and metro routes passing over the ground, ports, and areas with noise sources following the By-Law on Environmental Permit and License such as business/facilities or workshop-workshop-entertainment places that located in municipal boundaries and residential areas where noise maps will be prepared within the adjacent areas".

Ministry of Transport and Infrastructure is authorized and responsible for preparing the noise map of the highways that are classified as main highways from the state roads and highways outside the residential area, preparing the noise map of the main railways and main airports outside the residential area, preparing the noise map of the main highway, the main railway and the main airport outside the residential area, preparing noise maps of state roads and highways, railways and airports, and preparing noise maps of railways and airports within the residential area and under its responsibility.

Within the scope of Assessment and Management of Environmental Noise, it is necessary to prepare strategic noise maps for residential areas with a population above 100,000 and population density above 1,000 per square kilometer throughout Turkey. The number of provinces across Turkey of which noise maps should be prepared is 66.

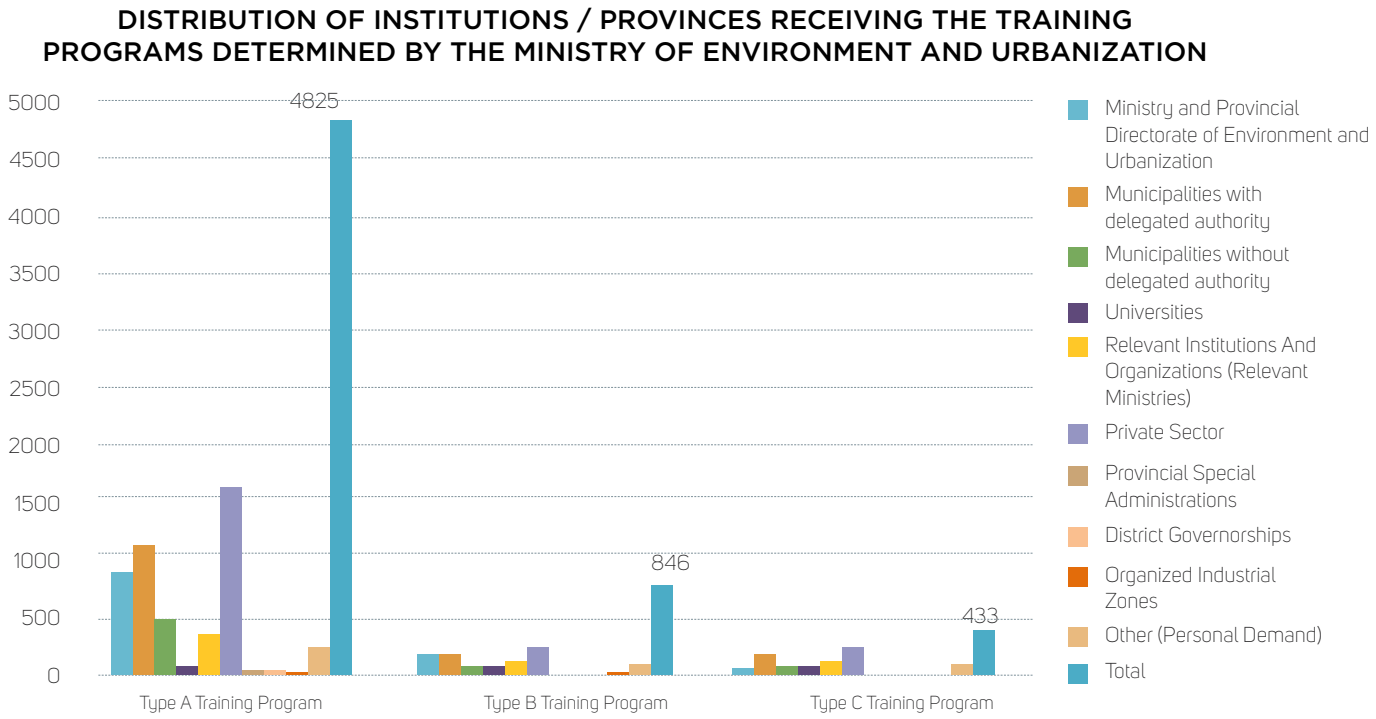
Noise maps were prepared for residential areas of 46 provinces as of the end of 2018 within the scope of national and international projects carried out by the Ministry of Environment and Urbanization. These provinces are İstanbul, Bursa, İzmir, Ankara, Kocaeli, Antalya, Konya, Malatya, Adana, Adıyaman, Balıkesir, Elazig, Erzurum, Eskişehir, Gaziantep, Kahramanmaraş, Kayseri, Manisa, Mersin, Sakarya, Samsun, Sivas, Trabzon, Diyarbakır , Bolu, Afyonkarahisar, Amasya, Aydın, Batman, Bingöl, Çorum, Denizli, Edirne, Hatay, Karabük, Karaman, Kütahya, Mardin, Muğla, Ordu, Rize, Şanlıurfa, Tekirdağ, Tokat, Uşak, Van. The remaining number of provinces of which noise maps should be prepared is 20.

Strategic noise maps of 49 airports were prepared, including İstanbul Atatürk, İstanbul Sabiha Gökçen, Ankara Esenboğa, Antalya, İzmir Adnan Menderes, Kayseri, Kahramanmaraş, Batman, Van Ferit Melen, Elazığ, Erzurum, Diyarbakır, Sivas Nuri Demirağ, Balıkesir Center, Trabzon, Gaziantep, Adıyaman, Samsun Çarşamba, Balıkesir Koca Seyit, Konya, Kocaeli Cengiz Topel, Amasya Merzifon, Hatay, Muğla Dalaman, Muğla Milas Bodrum, Nevşehir Cappadocia, Şanlıurfa GAP, Tokat, Adana, Çanakkale, Isparta Süleyman Demirel, Bursa Yenişehir, Erzincan, Malatya, Tekirdağ Çorlu, Uşak, Ağrı, Mardin, Siirt, Bingöl, Şırnak, Denizli Çardak, Hakkari Yüksekova Selahattin Eyyubi, Iğdır Martyr Bülent Aydın, Kars Harakani, Kastamonu, Muş Sultan Alparslan, Ordu-Giresun and Sinop Airports.

Noise maps of certain segments under their responsibility were prepared by the General Directorate of Highways. Noise maps of some ports within the borders of Samsun (Samsun Port), Istanbul (Haydarpaşa and Ambarlı Ports) and Kocaeli (Rota Port) were also prepared.

Regarding the noise action plan studies carried out by considering the strategic noise map results under the coordination of the Ministry of Environment and Urbanization; Environmental noise action plans for Konya, Bursa, Mersin, Kayseri, Sivas, Manisa, Istanbul, Kocaeli, Antalya, Bolu, Balıkesir, Tekirdağ, Gaziantep, Eskişehir, Kahramanmaraş, and Trabzon have been completed. Noise action plan works are still in progress in İzmir, Ankara, Sakarya, and Denizli provinces.

Graph 10 - Distribution of Institutions / Provinces Receiving the Training Programs Determined by the Ministry of Environment and Urbanization
(Ministry of Environment and Urbanization, July 2020)



To strengthen the technical infrastructure on noise and to ensure specialization throughout the country; Certificate Programs including "Basic Acoustics, Noise Mapping, Action Plans" have been prepared for meeting the needs of trained and experienced personnel in the industry, universities, institutions, and private consultancy firms, as well as in the competent administrations and the authorized administration.

As of July 2020; a total of 4825 people participated in the Type A Training Program on general acoustics, a total of 846 people participated in the Type B Training Program, and a total of 433 people participated in the Type C Training Program across Turkey.

Resources

Ministry of Environment and Urbanization

Ministry of Agriculture and Forestry

B. CLIMATE CHANGE

B. CLIMATE CHANGE

Since the greenhouse gases in the atmosphere are permeable to incoming solar radiation but much less permeable to the long-wave ground radiation emitted back, the natural process that allows the earth to warm more than expected and regulates the heat balance is called the natural greenhouse effect.

The United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol (KP) stipulate the control of six main greenhouse gases (CO_2, CH_4, N_2O, Hydrofluorocarbons-HFC, Perfluorocarbons-PFC and, Sulfurhexafluoride-SF_6). Chlorofluorocarbons-CFC and Hydro chlorofluorocarbons-HCFC, which cause ozone depletion in the stratosphere, are controlled by the Montreal Protocol.

Basic policies and measures in combating climate change focus on the energy, transportation, industrial processes, agriculture, waste, and land use, and forestry sectors.

B.1. Temperature Measurement Results in Turkey

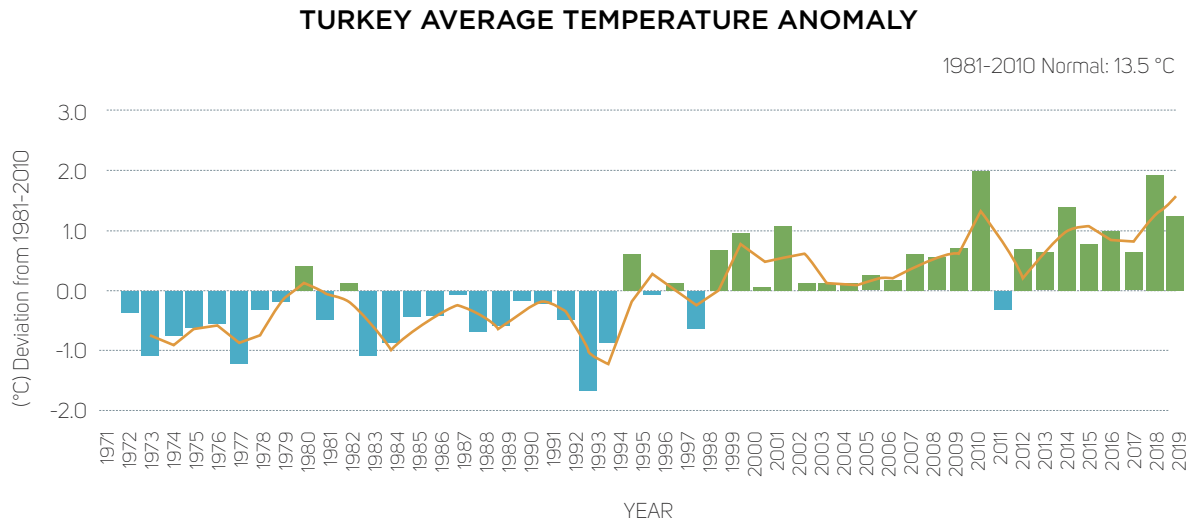
The General Directorate of Meteorology conducts monthly, seasonal and annual climate monitoring studies and shares these studies with the national and international public.

When the temperature changes between 1970 and 2019 are examined, it is seen that there have been temperature increases since 1993, except for 1997 and 2011 (Graph 11 and Graph 12). 2010 has been the warmest year of Turkey. 2019 has been the 4th hottest year since 1971. The average temperature, which was 13.2 ° C between 1971-2000, rose to 13.5 ° C between 1981-2010 (MGM, 2019).

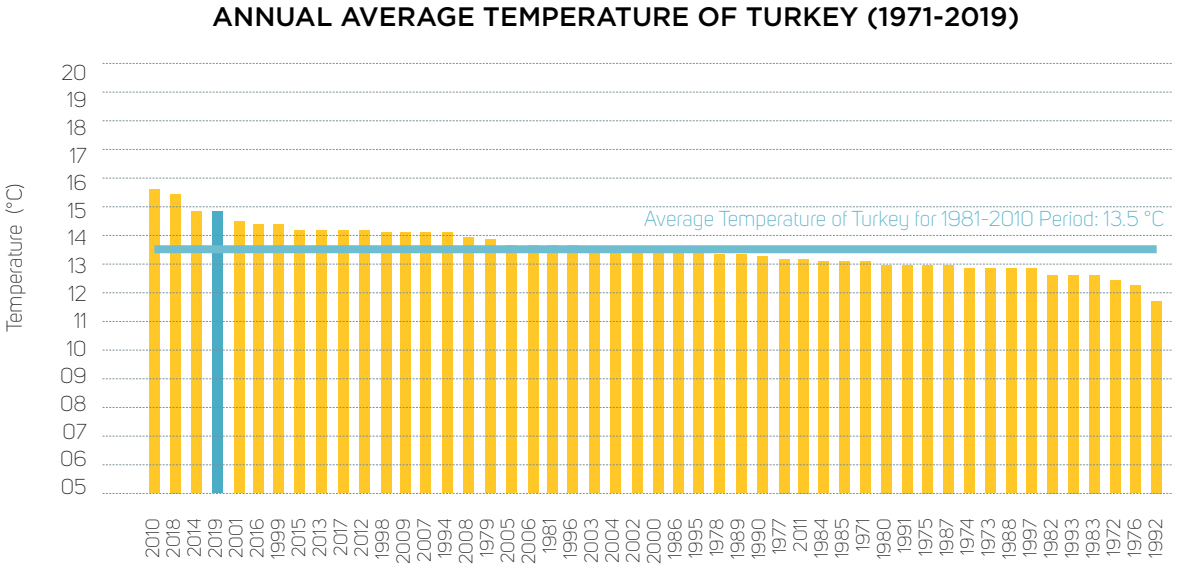
The average temperature of the 2018-2019 winter season is 4.9 ° C (1.3° C above normal), the average temperature of the spring season was 12.7 ° C (0.7° C above the normal), the average summer temperature was 24.4 ° C (1.0° C above the normal) and the autumn average temperature was 23.4 ° C (1.9 ° C above the normal).

In 2019, the lowest temperature was in Yüksekova with -28.1 ° C in January, and the highest temperature was in Cizre in August with 46.8 ° C.

Graph 11 - Turkey Average Temperature Anomalies
(MGM, 2020)

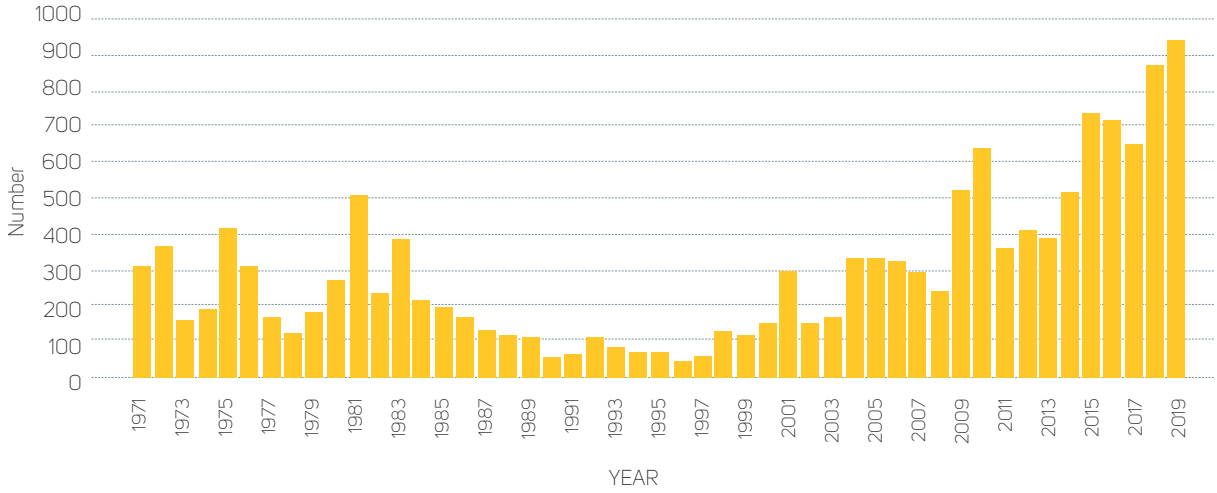


Graph 12 - Sorting of Annual Average Temperature of Turkey
(MGM, 2019)

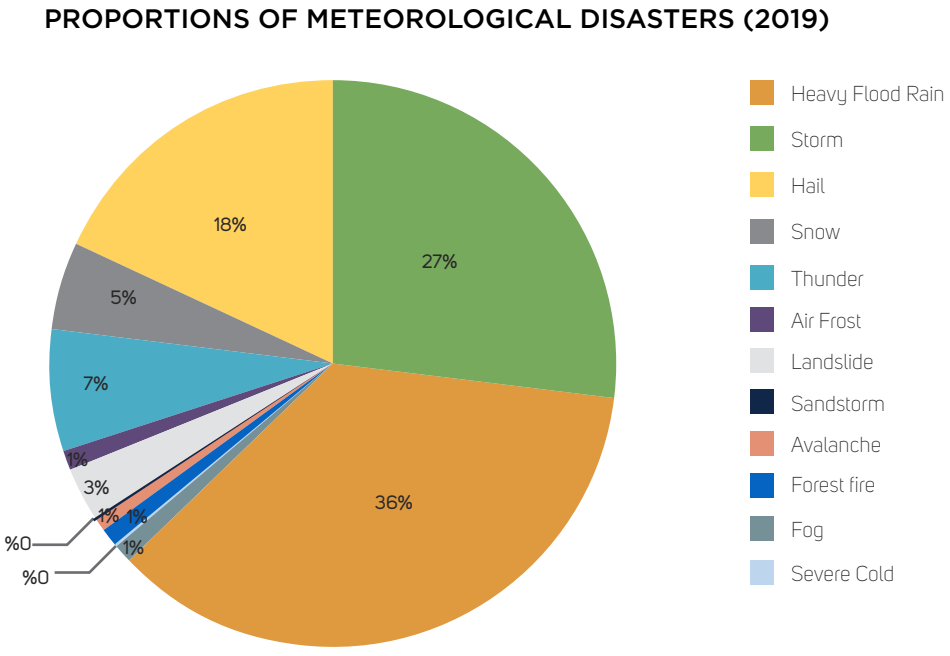


Extreme meteorological events: 2019 was the year that the highest number of extreme events experienced, with 935 extreme events. There is an increasing trend in extreme event trends, especially in the last two decades (MGM, 2019). Most of the extreme events recorded in 2019 were (36%) heavy rainfall/floods and (27%) storms. Other incidents were 18%, hail, 7%, lightning, 3%, heavy snow and 1% or less avalanche, forest fire, sandstorm and, fog with (Graphs 13 and 14).

Graph 13 - Number of Annual Extreme Meteorological Events in Turkey (MGM, 2020)



Graph 14 - Proportional Distribution of Extreme Events in 2019 (MGM, 2020)



B.2. Climate Change and Ongoing Studies in Turkey

According to the scenario developed for not taking any measures to reduce greenhouse gases that cause climate change, it is concluded that global emissions will increase by 37-52% in 2050, which will increase global average temperatures by 1.7-2.4 ° C compared to the pre-industrial period. Accordingly, the negative effects of climate change will increase.

The United Nations Framework Convention on Climate Change was signed in 1994 to combat climate change. As of today, the Convention has 196 parties (195 countries and the European Union). The Kyoto Protocol, which was prepared as the implementation tool of the Convention to provide internationally binding greenhouse gas emission commitments, was accepted in 1997 in the 3rd Conference of the Parties held in Japan. Turkey became a party to the United Nations Framework Convention on Climate Change on May 24, 2004, and to the Kyoto Protocol on August 26, 2009, but did not receive any greenhouse gas emission reduction obligation. Turkey accepted the Paris Agreement in 2015 and signed it on April 22, 2016, provided that the demand for access to financial and technical supports in the new climate regime are met. However, our country has not yet been a party to the Paris Agreement. Our negotiations for our country to become a party to the Agreement continue in line with national conditions and priorities. Processes involving our country's national contribution to the Paris Climate Agreement, which entered into force as of 2020, have been completed and notified to the UNFCCC Secretariat before the adoption of the Agreement on 30 September 2015. According to this; Turkey, in 2030, greenhouse gas emissions, has committed making up to 21% reduction from the increase. According to our national contribution, 246 million tons of greenhouse gas emissions will be prevented in 2030 and a total of 1 billion 920 million tons between 2012-2030. According to this; Turkey has committed reducing greenhouse gas emissions by up to 21% in 2030. According to our national contribution, 246 million tons of greenhouse gas emissions will be prevented in 2030 and a total of 1 billion 920 million tons between 2012-2030.

The Climate Change Adaptation Strategy and Action Plan of Turkey (2011-2023), which was prepared under the coordination of the Ministry of Environment and Urbanization and put into effect in 2011 underlies the climate change adaptation activities in Turkey.

There are objectives, targets, and actions regarding water resources management, agriculture sector and food security, ecosystem services, biodiversity and forestry, natural disaster risk management, and human health in the Adaptation Strategy and Action Plan. It is planned that the Climate Change Adaptation Strategy and Action Plan will be updated by harmonizing with the European Union Climate Change Adaptation Package and implemented more effectively.

It is inevitable to increase local efforts to carry out the fight against climate change more effectively in terms of both greenhouse gas reduction and adaptation to the effects of climate change. In this direction, there is a goal of preparing Local Climate Change Action Plan (LCCAP) in 30 Metropolitan Municipalities within the scope of the 2019-2023 Strategic Plan of the MoEU and a legislative study on the subject has been initiated to ensure the realization of LCCAPs at the city scale and to make it possible to compare the success rates and to put forward the national standard criteria by the Ministry of Environment and Urbanization.

Meteorological extreme weather events, whose number and frequency have increased in recent years due to the adverse effects of global climate change in our country, cause serious loss of life and property.

For this reason, the Ministry of Environment and Urbanization issued the Circular No. 2019/02 on Climate Change and Disaster Measures dated 22.01.2019 and numbered 18201 and conveyed to 81 Provincial Governorships and all Municipalities to implement measures against climate change-related disasters.

The occurrence of significant economic, social, and environmental damages due to disasters such as floods, floods, and landslides caused by the effect of climate change has made it necessary to take specific action measures in the Black Sea Region, which is one of our geographic regions most affected by climate change. The Black Sea Region Climate Change Action Plan has been announced by the Ministry of Environment and Urbanization to determine the action needs and solution suggestions that need to be addressed at the regional and urban scale to increase the resistance of the Black Sea Region against climate change, with the coordination and technical support of the Ministry of Environment and Urbanization. Regarding the subject, the Black Sea Region Climate Change Measures Circular No: 2019/13 dated 02.08.2019 and numbered 181888 was published and conveyed to the Black Sea Region Provincial Governorships and Mayors.

In addition to these studies, efforts are continuing to prepare climate change action plans specific to all geographical regions of our country, as climate change causes different effects in different regions and the economic, social, and environmental structures differ by region.

B.2.1 Projects Implemented on Climate Change in Turkey

The projects implemented within the Ministry of Environment and Urbanization;

- A draft Climate Change Law is being prepared, with the Partnership for Carbon Markets Readiness (Partnership of Market Readiness- PMR) World Bank Project, within the framework of legal and institutional infrastructure analyzes in Turkey and good practices in other countries. Studies relevant to the establishment of draft emission trading system legislation and an institutional framework for the implementation of the emission trading system, determination of the position of Turkey under Article 6 of the Paris Agreement, and identification of greenhouse gas emission limit and allocation plans are carried out.

- The By-Law on Tracking the Greenhouse Gas Emissions entered into force after being published in the Official Gazette No. 29003 dated 17 May 2014 within the framework of the bilateral cooperation between the Ministry of Environment and Urbanization and the German International Cooperation Agency (GIZ) within the scope of the Capacity Building Project on Monitoring, Reporting and Verification (MRV) of Greenhouse Gas Emissions, Efforts continue to update the by-law and the relevant sub-legislation.The by-law studies for the tracking of greenhouse gas emissions from the aviation, which are carried out with the General Directorate of Civil Aviation, have been initiated within the scope of the project and it is aimed to complete the draft by-law and establish a data management system specific to the aviation sector in the last quarter of 2020.

- The Seventh National Communication of the Republic of Turkey under the United Nations Framework Convention for Climate Change (UNFCCC) was submitted to the UNFCCC Secretariat on December 26, 2018, and Third Biennial Report was submitted on 1 January 2018, as a Party Country of Support Project for Preparation of 7th National Communication on Climate Change and 3rd Biennial Report and Annex I of the Convention. Besides, the Fourth Biennial Report was prepared and submitted to the Secretariat on 27 December 2019.

- However, our country's "National Climate Change Action Plan" (2023-2030) and "National Climate Change Strategy" (2050) is planned to be created under " The Support Project of Turkey for Preparation of 7th National Communication on Climate Change and 3rd Biennial Report" and our efforts and activities,

within the framework of the "Support Project of Turkey for Preparation of 7th National Communication on Climate Change and 3rd Biennial Report" being conducted by the Ministry of Environment and Urbanization, are still in progress in cooperation of our representatives of the public and private sector with those of 2050 Pathways Platform, of which our country is also a member.

- Capacity building and awareness activities will be carried out on a sectoral basis for public institutions, private organizations, and non-governmental organizations involved in the energy, transportation, industry, agriculture, forestry and waste sectors taking part within the framework of national contribution within the scope of "Capacity Building and Monitoring Project for Achieving the Greenhouse Gas National Contribution Target" and sub-projection studies will be carried out by preparing databases that form the basis of greenhouse gas projections. Furthermore, guiding evaluations for the policies of our country are made by examining the targets and policies for reduction and adaptation, included in the national contributions of the countries that are parties to the Paris Agreement, based on the sector.

- The Training Project for Developing Institutional Capacity on Adaptation to Climate Change has started as of January 2020. The target audience of the project is the institutions that are members of the Climate Change and Air Management Coordination Board. It is aimed to understand international experiences and good practices regarding compliance with the training to be given to the target audience.

- Strengthening Climate Adaptation Action Project in Turkey began in November 2019. These are aimed within the context of the project: updating Turkey's Climate Change Adaptation Strategy and Action Plan in the light of climate change impact and vulnerability analysis studies, determining 4 different pilot metropolitan municipalities, preparing "Local Climate Change Adaptation Action Plans" in the light of climate change impact and vulnerability analyzes of these cities, and conducting climate change adaptation studies at the local level, preparing first Climate Change Platform, providing a communication network for all the studies, data, scientific publications and all experts working in the field of climate change in Turkey thanks to the platform to be prepared and developing Turkey's resistance and adaptation capacity through grant projects to be benefited from local governments, non-governmental organizations, universities, and provincial organizations of relevant public institutions.

  "Enhancing Required Joint Efforts on Climate Action Project" was carried out between 2017-2020 by the MoEU. 37 grant projects implemented in 27 provinces to combat climate change were supported within the scope of the project. Local stakeholders such as municipalities, metropolitan municipalities, universities, non-governmental organizations, and provincial organizations benefited from the grant support of 3.5 million Euros in total. 539 awareness-raising activities were carried out and approximately 700 thousand people were reached with the grant projects carried out. Besides, more than 25 thousand people participated in 305 pieces of training, workshops, and meetings organized within the scope of grant projects. 265 research and data collection activities were carried out and 31 policy documents were published. Also, more than 50 thousand people have been reached through pilot field applications carried out within the scope of grant projects. More than 1 million people were reached with the photography competition held within the scope of the project activities and exhibitions held in 10 provinces. Within the scope of the project, pieces of training on climate change were carried out in 20 provinces, covering more than 60 provinces. Training modules under 17 different titles were prepared to be used in these pieces of training, and more than a thousand participants were trained in total.

- It is aimed to reduce human-induced greenhouse gas emissions by contributing to global efforts through a solution-based fight against climate change with the "Technical Assistance for Developed

Analytical Basis for Formulating Strategies and Actions towards Low Carbon Development" conducted by the Ministry of Environment and Urbanization. In this context; "Technical Assistance for Developed Analytical Basis for Formulating Strategies and Actions towards Low Carbon Development", which been conducted to research new business areas, R&D, and innovative approaches that enable environmentally sensitive economic growth by taking advantage of low-carbon growth opportunities in the waste, building, transportationi and agriculture sectors and accommodate to the EU climate policy and legislation over time by providing an analytical basis to support low-carbon development in the long term, was completed successfully in August 2020.

Within the Ministry of Agriculture and Forestry;

- Enhancing Climate Adaptation Action in Turkey Project was initiated in 2019. Projects aimed at identifying and monitoring possible positive/negative effects of climate change on agriculture and determining adaptation to climate change for sustainable agricultural production have been implemented.
- The National Project titled "Determining the Effects of Climate Change on Some Important Agricultural Products Compliance Areas" is carried out to determine the sensitivity in crop production in terms of adaptation to Climate Change and to reveal the effects.
- Monitoring and measuring activities conducted for the greenhouse gases emitted from agricultural activities and released into the atmosphere will provide data to the national greenhouse gas inventory in Southeastern Anatolia, Central Anatolia, and Aegean Regions, and will form the basis for policies and measures to reduce greenhouse gases from low-carbon production and green agricultural activities.

Studies in the field of Civil Aviation within the Ministry of Transport and Infrastructure:

"Green Airport Project" was put into practice in 2009 to systematically reduce and, if possible, eliminate the damages that organizations operating at airports open to civil air traffic cause or can give to the environment and human health, by providing the necessary infrastructure on environmental management principles and sustainability criteria required to manage airports sustainably in our country. The project, which was carried out voluntarily, has been made mandatory as of 2020 and the legislative works have taken their final forms. Within the scope of the legislation to be published; all enterprises operating in airports will continue to work in full compliance with the legislation of the Ministry of Environment and Urbanization and the specific criteria of the sector determined by the General Directorate of Civil Aviation. The contribution will be made to the carbon footprint studies by carrying out the monitoring, reporting, and verification processes of the emissions from the airports with the same legislation to be published. Our country fully participates and supports all projects implemented by the International Civil Aviation Organization (ICAO) within the scope of environmental protection and climate change prevention activities. In this context, Turkey became one of the countries that voluntarily accepted to apply the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which was accepted at the 39th General Assembly of ICAO, and finalized its efforts to publish its national legislation. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), which was started to be implemented in the 39th General Assembly of the International Civil Aviation Organization (ICAO), has been adopted by our country and Turkey has been included in the countries that have applied the first phase of the scheme. Annex 16 Vol IV document was published within the scope of the scheme by ICAO on June 28, 2018, for monitoring, reporting, and offsetting the emissions from international aviation activities by ICAO. The national legislation studies within the scope of this document have come to an end. By the scheme to be implemented; is aimed to reduce and control the emissions of the rapidly growing aviation sector, to offset the emissions from transportation by ensuring that environmental policies are implemented all over the world, and accordingly to reduce the effects of climate change.

B.3. Climate Change Models and Climate Change Projections

Since the global climate modeling studies are not sufficient in terms of resolution or detail, more detailed information with higher resolution is obtained by downscaling studies based on regions or countries. Climate change projections have been produced by the General Directorate of Meteorology for the first time in our country. Climate change data produced by the regional climate change model are shared with universities and the private sector, especially public institutions and organizations. These data are used in climate change and adaptation studies and scientific research. The results were included in the 7th National Communication on Climate Change and OECD Turkey Report prepared in 2018.

The annual average temperature increase in Turkey is foreseen as between 1.0 ° C - 2.0 ° C for the 2016-2040 period, between 1.5 ° C - 4.0 ° C for the 2041-2070 period, and between 1.5 ° C - 5 ° C for the last period 2071-2099 according to the results of the climate change projection studies conducted for Turkey. In some scenarios, it is predicted that the temperature increase in the last thirty years of the 21th century (2071-2100) will reach 3.0 ° C in winter and 8.0 ° C in summer.

Considering the precipitation; it is foreseen that there is an increase in the amount of precipitation throughout the country for the winter season in all periods, a decrease in the amount of precipitation in all periods except the coastal and northeast parts of the country in the spring season, a decrease in the amount of rainfall in all periods except the western coasts and the northeast parts of the country in the summer season and a decrease in the amount of precipitation in the autumn season in general.

Although there is no regular increase and decrease tendency in the amount of precipitation during the projection period (2016-2099), the irregularity of the precipitation regime is remarkable (MGM-TRCC-2015; Demircan et al, 2017 (a, b); MoEU 7UB, 2018). Regarding precipitation, increases in the amount of precipitation throughout the country are predicted for the winter season in all periods and decreases in the amount of rainfall in the spring months are predicted in all periods, excluding the coastal and northeastern regions of the country. While a decrease is expected in the summer months in all periods except the west coast and northeast regions of the country, a general decrease in precipitation is expected in autumn. Although there is no regular increase and decrease tendency in the amount of precipitation during the projection period (2016-2099), the irregularity of the precipitation regime is remarkable (MGM - TR2015-CC, 2015; Demircan et al., 2017; MoEU 7UB, 2018).

In the context of climate change; it is expected to be of serious risks in the river basins of Turkey in the new climate conditions. One of them is the decrease in the amount of rainfall in the inner parts of Anatolia and basins in the south, especially in the Euphrates-Tigris basin. The second is that increasing temperatures cause changes in the type of rainfall and the snow in winter turns into rain. Snow is an important source of water throughout the year. Furthermore, increasing temperatures will cause the snow to melt early in the spring. The third problem is the risk of excessive precipitation, especially in the summer season and especially in the western and northern coastal parts of Anatolia (Coastal Aegean, Marmara, and Black Sea regions). These extreme rainfalls may cause floods as in recent years. Also, increasing temperatures may cause an increase in the number and severity of extreme weather events such as storms, hail, and tornadoes. This situation is also compatible with current observations and the increasing trend of heavy rainfall and floods (Demircan et al., 2017 (a, b); Demircan et al., 2018; MoEU 7UB, 2018).

The results given below are obtained for the period 2071-2100 in the "Project for Determining the Effects of Climate Change on Snow Melts and Flows" in which the effect of climate change on snow load and melting and the changes that will have been caused by melting in river flows until the end of the 21th century in the Upper Euphrates Basin (Keban Dam upstream), where approximately 70% of the annual total water potential consists of snow melts are determined by the Ministry of Agriculture and Forestry, General Directorate of Water Management (GDWM). Accordingy, the followings are expected:

- The areas covered with snow in the Upper Euphrates Sub-basin will decrease by up to 44% compared to 1970-2000,
- The days when more than half of the basin is 'covered with snow' will decrease by 1.5 months compared to the past (1970-2000),
- Precipitation will be mostly in the form of rain and at least a 10% decrease in precipitation in the March-June period,
- The beginning of the snow melting period will be brought forward up to 10-15 days,
- The basin will be fed by rainfall rather than snowfall,
- Late accumulation and earlier melting will occur in the snow cover.

The results of the studies conducted by the Ministry of Agriculture and Forestry to determine the effects of climate change on water resources are shared on the website http://iklim.tarimorman.gov.tr.

Within the framework of the Ministry of Agriculture and Forestry (2019-2023), Strategic Plan and National Climate Change Action Plan (2011-2023); regional and national studies are carried out to monitor the positive/negative effects of climate variability by using climate-atmospheric models and different climate scenarios in products with high national added value to monitor the effects of global climate change on agricultural ecosystems within the scope of the integrated project named "Effects of Climate Change on Agriculture".

B.4. Amount of Greenhouse Gasses at National Level

With the implementation of the By-Law on Monitoring of Greenhouse Gas Emissions; the Ministry of Environment and Urbanization has been monitoring greenhouse gas emissions, which constitute about half of the national greenhouse gas emissions, at the facility level since 2015.

The by-law, published in the Official Gazette no. 28274 dated 25 April 2012, was prepared to harmonize the monitoring, reporting and verification of greenhouse gas emissions of the EU Emission Trade Directive 2003/87 / EC and ensured that an important step was taken for our country within the framework of harmonization with the EU Environmental Acquis. "By law on Tracking of Greenhouse Gas Emissions" was revised and published in the Official Gazette no. 29003 dated May 17, 2014.

The By Law on Tracking of Greenhouse Gas Emissions regulates the principles and procedures for the monitoring and reporting obligations of the facilities under its scope. Greenhouse gas emissions arising from approximately 750 facilities operating in the electricity generation, cement, iron, and steel, refinery, ceramics, lime, paper, chemistry, and glass sectors are monitored at the facility level within the scope of the legislation. In addition to this, emission reports submitted to the Ministry of Environment and Urbanization are evaluated by independent validators and the errors in the reported emission amounts are minimized.

The current legislation prepared based on "Communiqué on Monitoring and Reporting of Greenhouse Gases" and European Union's Validation of Gas Emission Reports and Accreditation Directive Numbered 600/2012 / EC based on the regarding the monitoring and reporting obligations in the By-Law and European Union's Greenhouse Gas Emission Monitoring and Reporting Directive numbered 601/2012 / EC;

- "Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions" was published in the Official Gazette No. 29068 dated July 22, 2014,

- "Communiqué on Verification of Greenhouse Gas Emission Reports and Accreditation of Verification Bodies" was published in the Official Gazette No. 29314 dated December 12, 2017.

According to the results of the greenhouse gas emission inventory; the total greenhouse gas emission in 2018 was calculated as 520.9 million tons (Mt) CO_2 equivalent (eq.), decreasing by 0.5% compared to the previous year. Energy-related emissions had the largest share in CO_2 equivalent emissions in 2018 with 71.6%, followed by industrial processes and product use with 12.5%, agricultural activities with 12.5%, and waste with 3.4%, respectively.

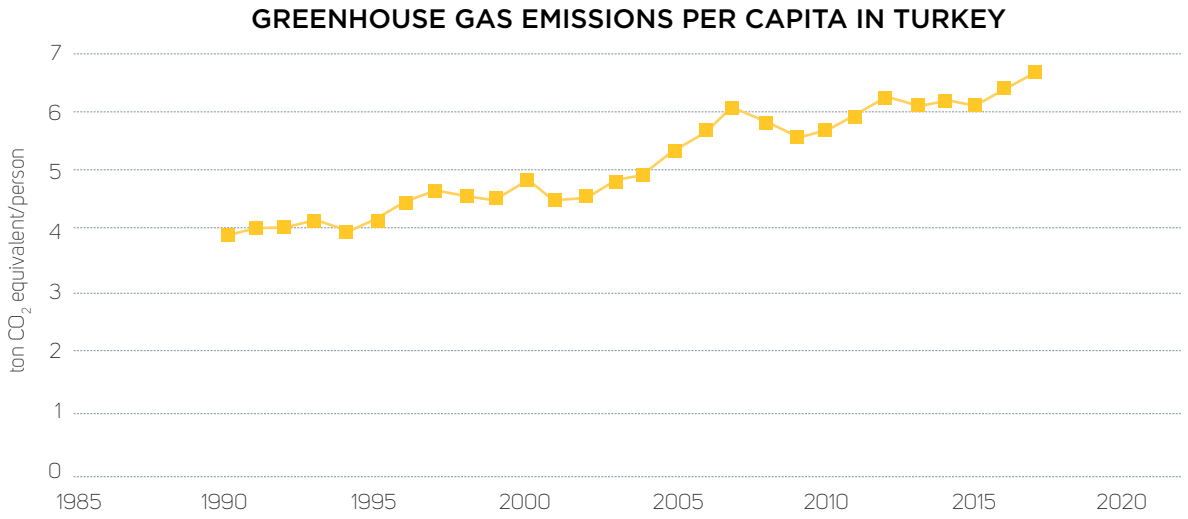
The total greenhouse gas emission per capita was calculated as 4 tons of CO_2 eq. in 1990, 6.5 tons of CO_2 eq. in 2017, and 6.4 tons of CO_2 eq. in 2018.

Table 41 - Per Capita Greenhouse Gas Emissions in Turkey (Ton CO_2 Equivalent / Capita) (TURKSTAT, 2019)

1990	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
3.98	4.05	4.09	4.15	3.98	4.15	4.41	4.52	4.49	4.38
2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
4.65	4.30	4.33	4.57	4.65	4.93	5.17	5.58	5.46	5.49
2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	
5.45	5.76	5.95	5.77	5.94	6.04	6.28	6.52	6.40	

Energy sector emissions increased by 167.3% in 2018 compared to 1990 and decreased by 1.8% compared to the previous year, calculated as 373.1 Mt CO_2 eq. Industrial processes and product use emissions were calculated as 65.2 Mt CO_2 eq., increasing 185.5% compared to 1990 and 2.5% compared to the previous year.

Graph 15 - Greenhouse Gas Emissions Per Capita in Turkey (TURKSTAT, 2019)



The agricultural sector emissions were calculated as 64.9 Mt CO_2 eq. in 2018, increasing by 41.5% compared to 1990 and 3.2% compared to the previous year, while waste emissions were calculated as 17.8 Mt CO_2 eq. in 2018, increasing by 60.3% compared to 1990, 2.1% compared to the previous year.

Graph 16 – Greenhouse Gas Emission Proportions by Gas in 2018
(TURKSTAT, 2019)

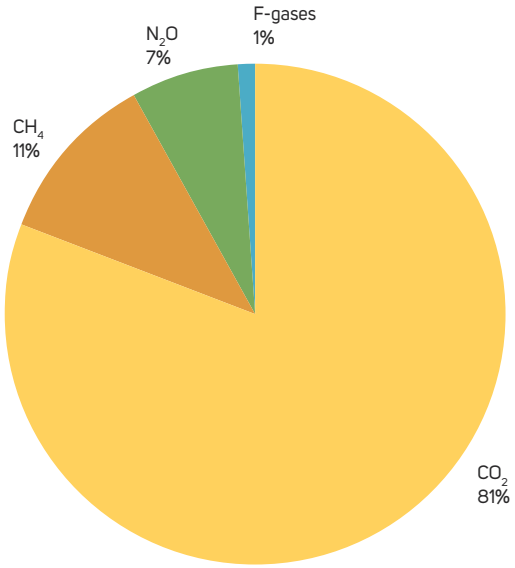


Table 42 - Greenhouse Gas Emissions by Gases, 1990-2018
(TURKSTAT, 2019)

	1990	2000	2010	2015	2016	2017	2018	1990-2018 change (%)	1990-2018 change (%)
Total Emission	219.4	298.8	398.9	472.6	497.7	523.8	520.9	137.5	-0.5
CO_2	151.5	229.8	314.4	381.4	401.2	425.3	419.2	176.7	-1.4
CH_4	42.4	43.6	51.3	51.4	53.9	54.2	57.6	35.8	-6.2
N_2O	24.8	24.7	29.6	35.0	37.4	38.8	38.9	56.8	0.2
F-gases	0.6	0.7	3.6	4.9	5.2	5.4	5.2	739.1	-1.9

The numbers in the table may not give the total number due to rounding.

Table 43 - Greenhouse Gas Emissions by Sector 1990 - 2018
(TURKSTAT, 2019)

Sectors	1990	2000	2010	2015	2016	2017	2018	1990-2018 change (%)	1990-2018 change (%)
Total Emission	219.4	298.8	398.9	472.6	497.7	523.8	520.9	137.5	-0.5
Energy	139.6	216.1	287.0	340.9	359.9	379.9	373.1	167.3	-1.8
Industrial processes and product use	22.8	26.2	48.1	57.1	61.1	63.6	65.2	185.5	2.5
Agriculture	45.8	42.1	44.1	55.8	58.5	62.8	64.9	41.5	3.2
Waste	11.1	14.3	19.5	18.8	18.4	17.4	17.8	60.3	2.1

The numbers in the table may not give the total number due to rounding.

Graph 17 - Greenhouse Gas Emission Proportions by Sectors in 2018 (TURKSTAT, 2019)

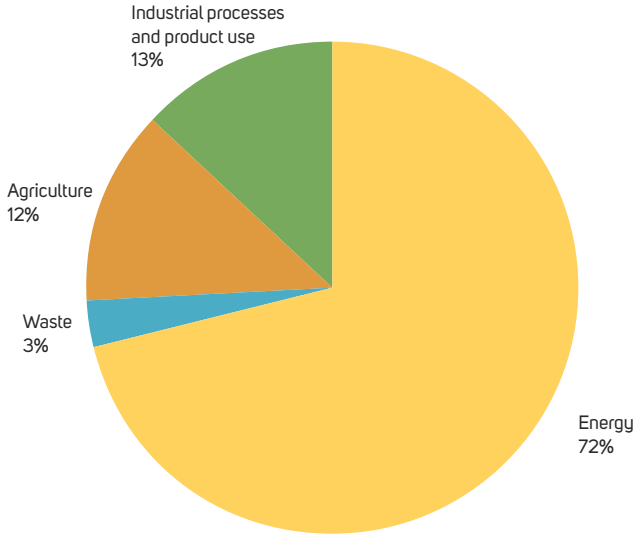


Table 44 - Percentage Distribution of Greenhouse Gas Emissions by Sectors (TURKSTAT, 2019)

Sectors	1990	2000	2010	2015	2016	2017	2018
Energy	63,63	72,32	71,95	72,13	72,31	72,53	71,63
Industrial processes and product use	10,39	8,77	12,06	12,08	12,28	12,14	12,52
Agriculture Waste	20,88	14,09	11,06	11,81	11,75	11,99	12,46
Waste	5,06	4,79	4,89	3,98	3,70	3,32	3,42

Table 45 - Total Greenhouse Gas Emissions by Sectors for 1990 - 2018 (CO_2 equivalent), (Million Tons)
(TURKSTAT, Greenhouse Gas Emission Inventory, 2019)

Year	Total	Change compared to 1990 (%)	Energy	Industrial processes and product use	Agricultural Activities	Waste
1990	219,4	.	139,6	22,8	45,8	11,1
1991	226,8	3.4	144,0	24,7	46,7	11,3
1992	233,0	6.2	150,3	24,3	46,8	11,5
1993	240,3	9.5	156,8	24,5	47,2	11,8
1994	234,3	6.8	153,3	24,2	44,7	12,0
1995	247,8	12.9	166,3	25,2	43,8	12,3
1996	267,4	21.9	184,0	26,2	44,5	12,7
1997	278,6	27.0	196,2	27,0	42,3	13,2
1998	280,2	27.7	195,9	27,4	43,5	13,5
1999	277,7	26.6	193,8	25,8	44,1	13,9
2000	298,8	36.2	216,1	26,2	42,1	14,3

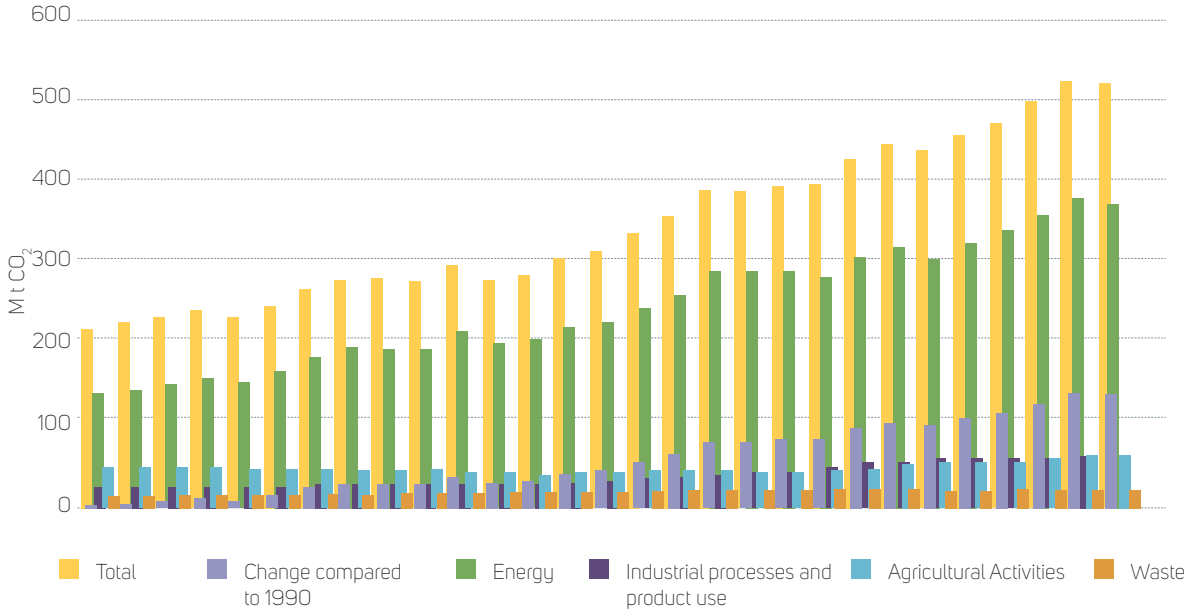
Year	Total	Change compared to 1990 (%)	Energy	Industrial processes and product use	Agricultural Activities	Waste
2001	280,3	27.8	199,2	25,9	39,7	15,5
2002	286,0	30.4	205,8	26,9	37,4	15,9
2003	305,3	39.2	220,3	28,2	40,5	16,2
2004	314,7	43.4	226,1	30,8	41,1	16,6
2005	337,1	53.7	244,0	33,6	42,2	17,3
2006	358,3	63.3	260,0	36,7	43,6	18,0
2007	391,4	78.4	290,8	39,2	43,2	18,3
2008	387,6	76.7	287,3	40,9	41,0	18,4
2009	395,6	80.3	292,5	42,5	41,8	18,8
2010	398,9	81.8	287,0	48,1	44,1	19,5
2011	427,8	95.0	308,7	52,8	46,6	19,8
2012	447,3	103.9	320,5	55,1	52,3	19,4
2013	439,3	100.3	307,5	58,1	55,5	18,2
2014	458,4	108.9	325,8	58,6	55,9	18,2
2015	472,6	115.4	340,9	57,1	55,8	18,8
2016	497,7	126.9	359,7	61,1	58,5	18,4
2017	523,8	138.8	379,9	63,6	62,8	17,4
2018	520,9	137.5	373,1	65,2	64,9	17,8

The numbers in the table may not give the total number due to rounding.

1990-2017 data in the table has been revised.

Emissions and sinks from forestry and other land use are not included.

Graph 18 - Distribution of Greenhouse Gas Emissions by Sectors (TURKSTAT, 2019)



The total greenhouse gas emission was calculated as 520.9 million tons (Mt) as CO_2 equivalent in 2018 according to the inventory results. Energy-based emissions had the largest share in CO_2 equivalent emissions in 2018, followed by industrial processes and product use, agricultural activities and waste, respectively.

Table 46 - Greenhouse Gas Amounts by Source (UNFCCC)

Greenhouse gas quantities by source	CO_2	CH_4	N_2O	NO_x	CO	NMVOC	SO_2
	(kt)						
Total Energy	366897.57	355.66	13.80	760.58	1991.89	245.24	2277.39
A. Fuel combustion activities (sectoral approach)	366740.41	94.02	13.80	760.58	1991.89	245.24	2277.39
1. Energy industries	153557.09	2.07	4.57	337.00	45.00	3.00	1561.00
a. Public electricity and heat generation	144814.09	1.94	4.56	328.00	41.00	3.00	1558.00
b. Oil purification	6359.89	0.12	0.02	6.00	3.00		
c. Manufacture of solid fuel and other energy industries	2383.11	0.01	0.00	3.00	1.00	NO	3.00
2. Manufacturing industry and construction	59958.34	3.18	0.48	111.00	414.00	44.00	414.00
a. Iron and steel	4322.24	0.08	0.01	41.00	146.00	14.00	124.00
b. Non-ferrous metals	1133.80	0.04	0.01	2.00	3.00	1.00	2.00
c. Chemicals	5305.82	0.18	0.02	8.00	10.00	3.00	16.00
d. Pulp, paper, and printing	938.75	0.05	0.01	1.00	3.00	NO	9.00
e. Food processing, beverage, and tobacco	4902.02	0.28	0.04	7.00	17.00	2.00	43.00
f. Non-metallic minerals	32430.37	2.05	0.32	52.00	235.00	24.00	220.00
g. Others	10925.33	0.50	0.07				
3. Transport	82953.37	15.38	4.43	187.58	298.89	52.24	8.39
a. Domestic aviation	3798.42	0.06	0.13	12.74	7.53	3.13	0.65
b. Highway transports	77094.40	15.19	4.13	137.45	286.90	47.50	0.14
c. Railways	369.00	0.02	0.15	6.18	1.26	0.55	
d. Domestic navigation	934.49	0.09	0.03	30.13	2.81	1.03	7.60
e. Other transportation	757.05	0.01	0.00	1.07	0.38	0.04	0.01

Table 47 - Greenhouse Gas Emissions (CO_2 Equivalent), 1990 - 2018 (Million Ton) (TURKSTAT, 2019)

	1990	1995	2000	2005	2010	2012	2013	2014	2015	2016	2017	2018
Total Mt CO_2 equivalent	219.4	247.8	298.8	337.1	398.9	447.3	439.3	458.4	472.6	497.7	523.8	520.9
Change compared to 1990 (%)	-	12.9	36.2	53.7	81.8	103.9	100.3	118.9	115.4	126.9	138.8	137.4

Table 48 - Greenhouse Gas Emissions (CO_2 Equivalent), 1990 - 2018 (Million Ton) (TURKSTAT, 2019)

Year	Total	CO_2	CH_4	N_2O	F-gases
1990	219.4	151.5	42.4	24.8	0.6
1991	226.8	158.0	43.3	24.6	0.9
1992	233.0	163.9	43.2	25.1	0.7
1993	240.3	171.0	43.0	25.9	0.4
1994	234.3	167.4	42.7	23.5	0.7
1995	247.8	180.9	42.5	23.7	0.6
1996	267.4	199.5	42.9	24.4	0.6
1997	278.6	212.0	42.1	23.9	0.6
1998	280.2	212.0	42.3	25.3	0.6
1999	277.7	207.8	43.7	25.6	0.6
2000	298.8	229.8	43.6	24.7	0.7
2001	280.3	213.5	42.8	23.2	0.8
2002	286.0	221.0	40.9	23.1	1.0
2003	305.3	236.5	42.9	24.7	1.2
2004	314.7	244.5	43.5	25.2	1.5
2005	337.1	264.2	45.2	26.1	1.7
2006	358.3	281.6	46.6	28.1	1.9
2007	391.4	312.7	49.0	27.4	2.3
2008	387.6	309.3	49.9	25.9	2.4
2009	395.6	315.4	49.6	28.3	2.4
2010	398.9	314.4	51.3	29.6	3.6
2011	427.8	339.5	53.7	30.7	4.0
2012	447.3	353.7	57.1	31.8	4.7
2013	439.3	345.2	55.5	33.8	4.8
2014	458.4	361.7	57.3	34.3	5.1
2015	472.6	381.3	51.4	35.0	4.9
2016	497.7	401.2	53.9	37.4	5.2
2017	523.8	425.3	54.2	38.8	5.4
2018	520.9	419.2	57.6	38.9	5.2

The numbers in the table may not give the total number due to rounding.

1990-2017 data in the table has been revised.

Emissions and sinks from forestry and other land use are not included.

Table 49 - Amounts of the Annual Greenhouse Gas (t CO_2Equivalent) Occlusion by the Land Use, Land-Use Change, and Forestry (LULUCF) Sector between 1990-2018 (General Directorate of Forestry, 2020)

Years	LULUFC Annual Greenhouse Gas Emission Occlusion CO_2 equivalent – Gg)
1990	-55.770
1991	-56.710
1992	-56.820
1993	-56.040
1994	-57.420
1995	-57.380
1996	-57.700
1997	-61.690
1998	-62.610
1999	-64.020
2000	-61.550
2001	-64.700
2002	-72.450
2003	-74.530
2004	-73.640
2005	-74.650
2006	-74.660
2007	-74.350
2008	-69.150
2009	-72.770
2010	-73.410
2011	-77.080
2012	-74.470
2013	-76.490
2014	-77.500
2015	-97.260
2016	-95.930
2017	-99.880
2018	-94.560

(National Greenhouse Gas Inventory, Land Use, Land-Use Change, and Forestry Section)

B.5. Sink Areas in Turkey

Forests are important sink areas for greenhouse gases. They have the effect of reducing total greenhouse gas emissions, especially in terms of carbon capture in the greenhouse gas inventory. Sustainable forest management, afforestation, increasing forest areas, transforming degraded forests into productive forests (rehabilitation), forest maintenance (silviculture), effective forest protection, and forest fire management activities of the General Directorate of Forestry are activities that increase the sink potential of forests and create a greenhouse gas reduction effect. The results of these activities are reflected in the annual

amount of CO_2 removed by the forestry sector of the Land Use, Land-Use Changes and Forestry (LULUCF) section of the National Greenhouse Gas Inventory Report, which is reported to the United Nations Framework Convention on Climate Change Secretariat. Furthermore, the removed CO_2 within the category of the processed forest products in the LULUCF section of the National Greenhouse Gas Inventory Report is also a sink mechanism related to forestry.

All activity data in LULUCF Sector changed in 2019. In this context, in the Greenhouse Gas Inventory reports made as of 2019, all series were recalculated and updated as shown in the graphic below.

Table 50 - Total CO_2 Occlusions of the Forestry and Processed Forest Products and LULUCF Sector of National Greenhouse Gas Inventory Report

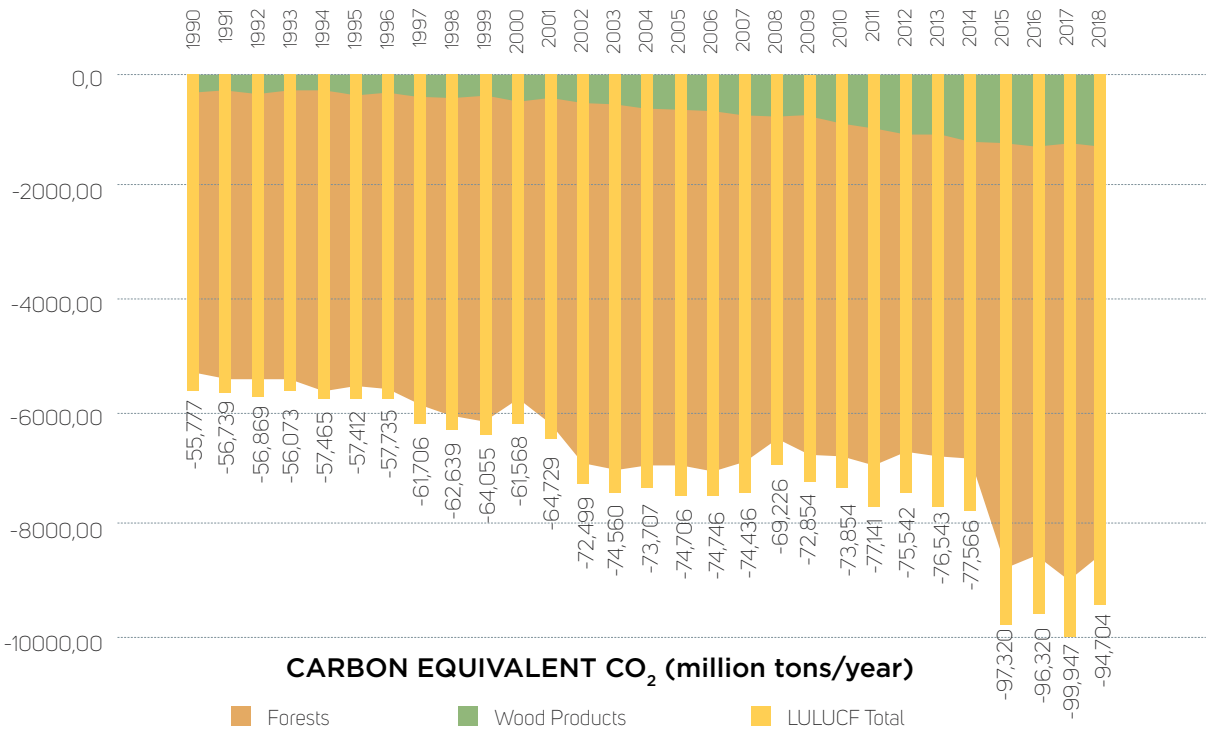
(General Directorate of Forestry, 2020)

	Annual Greenhouse Gas Occlusions of Our Forests (CO_2 equivalent – Kt)	Annual Greenhouse Gas Occlusions of Processed Forest Products (CO_2 equivalent – Kt)	Annual Greenhouse Gas Occlusions of LULUCF (CO_2 equivalent – Kt)
1990	52800	2947	55770
1991	54390	2601	56710
1992	54130	3321	56820
1993	54300	2580	56040
1994	56160	2359	57420
1995	54960	3333	57380
1996	55770	2999	57700
1997	59000	3448	61690
1998	60300	3651	62610
1999	61610	3625	64020
2000	57890	4304	61550
2001	61400	3811	64700
2002	68850	4834	72450
2003	70260	5071	74530
2004	69590	5642	73640
2005	69350	6379	74650
2006	70280	6315	74660
2007	68870	7055	74350
2008	63960	7312	69150
2009	67380	6978	72770
2010	67610	8334	73410
2011	69380	9302	77080
2012	67150	10081	74470
2013	67900	10582	76490
2014	68090	11627	77500
2015	87660	12200	97260
2016	85230	13000	95930
2017	90190	12115	99880
2018	84840	12130	94560

(National Greenhouse Gas Inventory, Land Use, Land-Use Change, and Forestry Section)

Graph 19 - Annual Greenhouse Gas Amount Occlusions by LULUCF Sector (Kilo Ton CO_2 Equivalent) (General Directorate of Forestry, 2020

(National Greenhouse Gas Inventory, Land Use, Land-Use Change, and Forestry Section)



B.6. Studies on the Emission Trading in Turkey

The application principles of carbon pricing and market-based approaches such as the emission trading system (ETS), carbon tax, green and white energy certificates, and extended credit mechanism are detailed and their applicability in our country has been examined in the prepared analytical reports within the scope of the 1st Implementation Phase of the Partnership for Carbon Markets Readiness (Partnership of Market Readiness- PMR) Project. Furthermore, the mitigation and economic impact of these mechanisms were determined through modeling studies. A synthesis report on "Implementation of Carbon Pricing Policies in Turkey", prepared by bringing together all evaluations conducted between 2014-2018 as the ultimate goal of the project, were presented to key stakeholders, primarily Climate Change and Air Management Coordination Board.

Draft legislation is prepared within the framework of the legal, institutional infrastructure and good practices in other countries for the pilot implementation of the emission trading system with the grant support to be provided in the 2nd Implementation Phase started in 2019. Moreover, the upper limit of emission and a national allocation plan are prepared to establish the technical infrastructure, the greenhouse gas emission registration system will be renewed and ETS simulation study has been carried out. In addition to these, the Draft Climate Law is prepared within the scope of the project. The activities to be carried out in Phase 2 are aimed at putting the carbon pricing system into action with a pilot implementation by taking the stakeholder's opinions, in case of a political decision in our country, and at increasing our country's preparations in this sense. The upper limit of emission will be determined for the sectors covered by the 2020 – 2030 Monitoring, Reporting, and Verification Legislation and allocation plans will be prepared for each sector.

B.7. Studies on Ozone-Depleting Substances in Turkey

Our country became a party to the Vienna Convention on the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer in 1991 and accepted all changes of the Protocol. National and international studies on the protocol are carried out under the coordination of the Ministry of Environment and Urbanization (MoEU).

With the termination of Ozone-Depleting Substances (ODS) all over the world; the fluorinated greenhouse gases, which are widely used as alternatives to these gases, were added to substances that were taken under control due to their high greenhouse gas effects by the Montreal Protocol with the Kigali Amendment adopted in 2016. "The Law Proposal Regarding the Approval of the Amendment to the Montreal Protocol (Kigali Amendment-2016): The amendment to the Montreal Protocol agreed by the Twenty-Eighth Meeting of the Parties", regarding the Kigali Amendment was accepted by the TBMM Foreign Affairs Committee on 29 May 2019. The "By Law on Reduction of Ozone-Depleting Substances" published in the Official Gazette No. 27052 dated November 12, 2008, was prepared under the European Union's Directive No. 2037/2000. Directive 1005/2009 of the European Union was published after the By-Law published on November 12, 2008. The by law in question was revised and published in the Official Gazette No. 30031, dated April 7, 2017.

The By Law on Fluorinated Greenhouse Gases, which entered into force after being published in the Official Gazette No. 30291, dated 4/1/2018 within the scope of harmonization studies with the European Union Acquis by taking into account the European Parliament and Council By-Law on Fluorinated Greenhouse Gases No. dated 16/4/2014 and numbered 517/2014, was revised and a draft by-law was prepared.

The Communiqué on Certification of Natural and Legal Persons Whose Operation is Based on Equipment That Contains, or Whose Functioning Relies Upon Fluorinated Greenhouse Gases entered into force after being published in the Official Gazette No. 31254, dated 24/09/2020.

Under By-Law on the Ozone-Depleting Substances (ODS); the imports of these substances, which are not produced in our country, are brought under control and terminated by the Ministry of Environment and Urbanization. ODSs are allowed to enter the country within the framework of the quota determined by decreasing each year, and they are monitored by the electronic tracking system of the Ministry of Environment and Urbanization from the import stage to their use in the country at the service stage. The amount of ODS quota, which has been allowed to be imported as quota since 2009, was reduced to 100 tons in 2020.

Turkey is among the successful countries in the implementation of the Montreal Protocol, to which 197 countries are parties. Our country received the "Europe and Central Asia Regional Ozone Network Honor Medal for Protection of the Ozone Layer" in 2012, 2014, 2016, and 2019.

Resources

Ministry of Environment and Urbanization

Ministry of Transport and Infrastructure

TURKSTAT

General Directorate of Meteorology

General Directorate of Forestry

Turkish Greenhouse Gas Inventory 1990-2018, National Inventory Report for submission under the United Nations Framework Convention on Climate Change

TURKSTAT, Greenhouse Gas Emission Statistics, 1990-2018, No: 33624, 31 March 2020

C. WATER AND WASTEWATER MANAGEMENT

C. WATER AND WASTEWATER MANAGEMENT

Approximately 1.1 billion people (18% of the world population) have problems in accessing clean water resources. 2.4 billion people do not have enough healthy water. Water demand is increasing day by day and accessible freshwater resources are decreasing day by day due to pollution. As a result of the pollution of limited water resources and the increased need for water, sustainability and controlled use of natural resources, as well have gained importance all over the world, and studies conducted on alternative water resources have increased especially in the last two decades. Developing technology has had positive effects on accelerating this process, and applications have become widespread with safewastewater recovery.

C.1. Water Resources and Potential of Water in Turkey

Turkey is not a water-rich country. Our country is a country experiencing water scarcity according to the annual amount of water per person. Turkey has a water potential of 1,652 m^3 per person per year according to the water potential calculations of General Directorate of State Hydraulic Works (SHW). The population of Turkey will reach 100 million in 2030 and the water potential will decrease to 1,120 m^3 per person per year according to the projections. Turkey will be among the countries with water shortages and will have to follow policies aiming to use the resources more effectively.

C.1.1. Surface Waters

Turkey is divided into 25 basins in line with their hydrological characteristics. The average total annual precipitation in the basins is 186 billion m^3. The Euphrates and Tigris Basin, which has 28.4 percent of Turkey's potential, is the largest basin with both its surface area and its water potential, and it goes beyond the borders of the country. Other transboundary basins are the Coruh River Basin from north to south, the Aras River Basin, the Asi River Basin, and the Meriç River Basin in the west. These basins also have an important place in Turkey's international relations due to their transboundary characteristics.

Table 51 - Annual Average Water Potential of Surface Water by Basins, 2013-2018 (SHW, 2020)

Basin No	Basin Name	2016			2017			2018		
		Basin Rainfall Area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)	Basin Rainfall Area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)	Basin Rainfall Area (km^2)	Average Annual Flow (km^3)(***)	Potential Participation Rate (%)
01	Meriç Ergene	14444.1	1.842296	1.019029	14444.1	1.842296	1.019029	14486	1.657	0.893902
02	Marmara	23107.2	7.540264	4.170748	23107.2	7.540264	4.170748	23074	7.44	4.013659
03	Susurluk	24332	4.226009	2.337534	24332	4.226009	2.337534	24319	4.96	2.675773
04	North Aegean	9973.6	1.500611	0.830033	9973.6	1.500611	0.830033	9861	1.99	1.073546
05	Gediz	17034	1.544823	0.854488	17034	1.544823	0.854488	17137	1.78	0.960257
06	Little Menderes	7059.7	0.527608	0.291836	7059.7	0.527608	0.291836	6963	0.62	0.334472
07	Greater Menderes	26133.2	2.968685	1.642069	26133.2	2.968685	1.642069	25960	3.05	1.645385
08	West Mediterranean	21223.9	6.969108	3.854824	21223.9	6.969108	3.854824	20956	6.5	3.506557
09	Antalya	20330.8	13.08281	7.236498	20330.8	13.08281	7.236498	20429	12.94	6.980746
10	Burdur Lakes	6306.2	0.255866	0.141527	6306.2	0.255866	0.141527	6294	0.23	0.124078
11	Akarçay	7982.6	0.325534	0.180063	7982.6	0.325534	0.180063	7995	0.37	0.199604
12	Sakarya	63357.8	5.158233	2.853174	63357.8	5.158233	2.853174	63303	6.49	3.501163
13	Western Black Sea	28929.8	9.914087	5.483781	28929.8	9.914087	5.483781	28855	10.8	5.82628
14	Yeşilırmak	39628	6.582307	3.640873	39628	6.582307	3.640873	39595	7.05	3.803266
15	Kızılırmak	82197.3	6.120015	3.385165	82197.3	6.120015	3.385165	82181	7	3.776292
16	Konya Closed	50037.8	2.647268	1.464284	50037.8	2.647268	1.464284	49930	2.41	1.300124
17	East Mediterranean	21807	8.240113	4.557855	21807	8.240113	4.557855	21150	7.56	4.078396
18	Seyhan	22241.6	6.785813	3.753438	22241.6	6.785813	3.753438	22035	6.2	3.344716
19	Asi	7912.4	1.813288	1.002985	7912.4	1.813288	1.002985	7886	1.78	0.960257
20	Ceyhan	21598.5	7.371492	4.077395	21598.5	7.371492	4.077395	21391	7.73	4.170106
21	Fırat - Dicle (*)(**)	176142.7	55.41926	30.65407	176142.7	55.41926	30.65407	176143	56.32	30.38297
22	Eastern Black Sea	22844.6	16.4614	9.105298	22844.6	16.4614	9.105298	22846	16.43	8.863498
23	Çoruh	20248.7	7.047236	3.898039	20248.7	7.047236	3.898039	20248.7	6.98	3.765503
24	Aras	28114.6	4.181758	2.313057	28114.6	4.181758	2.313057	27775	4.48	2.416827
25	Van Lake	17977	2.263371	1.251939	17977	2.263371	1.251939	17861	2.6	1.402623
Total		780965.1	180.7893	100	780965.1	180.7893	100	778673.7	185.367	100

NOTE: 1- 2013-2015 data remained unchanged.

2- The reason for the changes of the data in 2016 and 2017;

...is the update of values of the underground water potential evapotranspiration and potentials of Turkey's territorial average precipitation, surface and underground waters within the context of "Determination of Turkey's Water Budget Project" taking part in the activities of the Hydrology Specialization Committee under the former Ministry of Forestry and Water Affairs.

401 SGSs, which are located in the main branch, side branch, and basin outlets that can represent the basin and have a period of 1981-2010, were determined for the 25 basins of Turkey and started in September 2014 and completed as of the end of 2015, and the results obtained as a result of the said project work are included in our 2016,2017 Table.

3- As a result of the completed basin master plan studies, the data were updated in 2018.

4- National Basin Coding has been used.

(*) Fırat River mainland's annual flow is 30.64 km 2016 (2016, 2017), 31.13 km³ (2018).

(**) Dicle River mainland's annual flow is 24.78 km³ (2016, 2017), 25.19 km³ (2018).

(***) These values are obtained from the downstream base station flows of the basins.

C.1.2. Ground Waters

"By-Law on the Protection of Groundwater against Pollution and Deterioration" was published in the Official Gazette No. 28257 dated 07.04.2012 to ensure that the quantity and quality of groundwater are managed together and that the EU's requirements for groundwater management can be fulfilled. The necessary principles were determined for the prevention of pollution and deterioration of groundwater, preservation of the current condition of good groundwater, and improvement of the poor groundwater with the aforementioned by-law.

In Table 52, the change of the annual groundwater potential according to the basins in Turkey is given.

Table 52 - Annual Groundwater Potential by Basins (hm³ / year), 2016-2018 (SHW, 2020)

Basin No	Basin Name	2016		2017		2018	
		Ground Water Recharge	Ground Water Management Reserve	Ground Water Recharge	Ground Water Management Reserve	Ground Water Recharge	Ground Water Management Reserve
1	Meriç - Ergene	507.7	498.2	507.7	498.2	507.7	498.2
2	Marmara	241.7	210.7	241.7	210.7	241.7	210.7
3	Susurluk	780.4	585.9	780.4	585.9	780.4	585.9
4	North Aegean	289.4	212.9	289.4	212.9	289.4	212.9
5	Gediz	1155.9	866.9	1155.9	866.9	1155.9	866.9
6	Little Menderes	179.2	179.2	179.2	179.2	179.2	179.2
7	Greater Menderes	1045.4	761.5	1045.4	761.5	1045.4	761.5
8	West Mediterranean	473.2	316.7	473.2	316.7	473.2	316.7
9	Antalya	1164.7	576.3	1164.7	576.3	1164.7	576.3
10	Burdur Lakes	106.4	89.5	106.4	89.5	106.4	89.5
11	Akarçay	345.4	345.4	345.4	345.4	345.4	345.4
12	Sakarya	2197.1	1545.2	2197.1	1545.2	2197.1	1545.2
13	Western Black Sea	641.2	607.6	641.2	607.6	641.2	607.6
14	Yeşilırmak	907.2	872.8	907.2	872.8	907.2	872.8

Basin No	Basin Name	2016		2017		2018	
		Ground Water Recharge	Ground Water Management Reserve	Ground Water Recharge	Ground Water Management Reserve	Ground Water Recharge	Ground Water Management Reserve
15	Kızılırmak	2003.1	1762.9	2003.1	1762.9	2003.1	1762.9
16	Konya Closed	2597.0	2023.0	2597.0	2023.0	2597.0	2023.0
17	East Mediterranean	96.5	70.5	96.5	70.5	96.5	70.5
18	Seyhan	838.8	749.9	838.8	749.9	838.8	749.9
19	Asi	393.2	289.5	393.2	289.5	393.2	289.5
20	Ceyhan	985.3	533.5	985.3	533.5	985.3	533.5
21	Fırat - Dicle	4994.8	3763.7	4994.8	3763.7	4994.8	3763.7
22	Eastern Black Sea	490.9	490.9	490.9	490.9	490.9	490.9
23	Çoruh	30.0	20.0	30.0	20.0	30.0	20.0
24	Aras	388.5	294.4	388.5	294.4	388.5	294.4
25	Van Lake	179.2	148.2	179.2	148.2	179.2	148.2
Toplam		**23032.3**	**17815.3**	**23032.3**	**17815.3**	**23032.3**	**17815.3**

(http://www.dsi.gov.tr/dsi-resmi-istatistikler/resmi-i-statistikler-2018/2018-y%C4%B1l%C4%B1-verileri)

C.1.3. Seas

Seas have a very important place in the daily life of human beings. On the one hand, it is an important source of food and life for humans and other living things, on the other hand, it is an important economic resource for sea transportation, marine tourism, mineral extraction, and energy.

C.1.3.1. Factors Affecting the Marine Environment

C.1.3.1.1. Shipborne Pollution

The By-Law on Waste Reception from Ships and Waste Control (Amendment: 18.03.2010 - 27525 Official Gazette)- was issued based on "The International Convention for the Prevention of Pollution from Ships" MARPOL 73/78 which was prepared by the Environment Law No. 2872, the Directive 2000/59/EC of the European Parliament and the Council on Port Reception Facilities for Ship generated Waste and Cargo Residues No. 2000/59 / EC and the International Maritime Organization (IMO) and to which our country became a party in 1990. Processes relevant to the By-Law and the legislation regulating the management of ship waste is still in progress. Within this context;

- While the number of licensed waste reception facilities that provide ship waste collection service from the port was 18 in 2005 in Turkey, waste collection services have been provided to ships through 163 waste reception facilities at 305 coastal facilities as of September 2020.
- Studies and activities are carried out by the Central and Provincial Organization of the Ministry of Environment and Urbanization to enable that the newly established coastal facilities that require revision in waste management plans comply with the provisions of the By-Law.
- The Ship Waste Tracking System (SEATRAC), which started to be implemented in all facilities across the country in 2011, enables ships to report their wastes online and monitor the process online from waste reception facilities to the disposal facility. Ship wastes are practically tracked electronically and more effective management is provided through this system, Efforts to further improve the system are ongoing.

- On the other hand, the Blue Card system, which has been implemented in parallel with SEATRAC, enables the effective collection of wastes on boats and their online tracking up to the disposal facility.
- SEATRAC and Blue Card systems have been combined under the Marine Debris Tracker Application.
- Control of Illegal Discharges from Ships is an important issue to be taken into account in the prevention of marine pollution. The Ministry of Transport and Infrastructure, the Coast Guard Command, and the Istanbul, Kocaeli, Antalya, and Mersin Metropolitan Municipalities have delegated authority by the Ministry of Environment and Urbanization to control illegal discharges originating from ships, and the developments on the subject are closely followed.

Information about the wastes on the ships and whether the wastes will be given to the land facility at the port are entered into the Port Authority electronic system, the amount of waste is questioned at the berthing of the ships and before the ship leaves the port, and it is ensured that the waste in excess is delivered to the waste reception facilities. These works contribute to the prevention of marine pollution because of the ship waste.

C.1.3.1.2. Marine Litter Management

Marine litter is defined as materials produced or used by humans and left on seas, rivers, or beaches.

Rules regarding the protection of the environment, our seas, and effective management of wastes are regulated by our national legislation, especially the Environment Law, Municipalities Law, and the Law of Misdemeanors in our country. International efforts to tackle the marine litter problem are closely monitored and harmonization studies are carried out by the Ministry of Environment and Urbanization.

The Ministry of Environment and Urbanization supports the sea and coastal cleaning campaigns of non-governmental organizations for raising public awareness.

The opening event of the Zero Waste Blue movement following the Zero Waste Project was held in our city of Istanbul on June 10, 2019, under the auspices of the Turkish President's Wife Emine ERDOĞAN. This movement aims to implement systematic practices to reduce marine litter and to increase environmental awareness in society. With the Zero Waste Blue opening event, campaigns have been launched all over Turkey to protect the marine environment and support cleaning activities during the tourist season.

A new Circular on "The Preparation and Implementation of Marine Litter Provincial Action Plans" was published by the Ministry of Environment and Urbanization on 10 June 2019 to address the marine litter issue more effectively and concretely, including our obligations under the Barcelona and Bucharest Conventions. This Circular aims that all organizations work in coordination to bring an integrated approach to the issue of combating marine litter, to ensure unity in practices, and to follow up with regular and continuous work.

The Regional Action Plans on Marine Litter were prepared as of the beginning of 2020 for all our coastal provinces under the responsibility of the Governors of our 28 coastal provinces and published on the websites of the Provincial Directorate of Environment and Urbanization. The waste that is collected and other activities carried out within the scope of the plans are reported to the Ministry of Environment and Urbanization. 65,250 tons of marine litter were collected from our seas and coasts in 2019 and 7,517 tons of marine litter in the first 9 months of 2020 and sent for disposal within the scope of Zero Waste Blue.

The Ministry of Environment and Urbanization will follow up the regional action plans on marine litter studies and activities through annual reports. The first annual reports on the implementation of the action plans will be submitted to the Ministry of Environment and Urbanization by the Governorships of our 28 provinces with a coastline by the end of 2021.

C.1.3.1.3. Sea Bottom Dredging Activities

Activities regarding dredging and discharging of the dredged material, especially to the sea area, in our country are carried out within the scope of the Barcelona and Bucharest Conventions and the annex protocols of these conventions prepared within the framework of the London Protocol by the International Maritime Organization (IMO).

Within this scope, "By-Law on Environmental Management of Dredge Material " entered into force after being published in the Official Gazette No.31008 dated 14.01.2020 to ensure the necessary compliance with the conventions to which our country is a party, environmental management of dredging activities carried out in the sea and coastal areas and river mouths, beneficial use of dredging materials generated from these activities, and to determine the procedures and principles regarding the elimination or disposal of them in the marine environment without harming the environment and human health.

The legislation covers the determination of the characteristics of the discharge areas in our territorial waters, the quality standards for the pollutant parameters of the discharge materials, the issuance of permission/ license required for the pouring to the discharge areas, and the monitoring and inspection of the discharge areas in terms of pollution load.

In addition to this, the Circular on Implementation and Delegation of Authority for Dredging and Discharge Activities No.2020/4 was published by the Ministry of Environment and Urbanization on 20.02.2020. The Circular includes the discharging methods, discharge areas, ecotoxicological analysis methods, Monitoring and Ecological Report formats that should be submitted to the Administration and the delegation of authority for the inspection of discharge activities within the scope of environmental management of dredging material.

By Law on Dredging of the Sea and Inland Waters was published in the Official Gazette No. 29796, dated 09.08.2016, and has entered into force as of 09.02.2017 by the Ministry of Transport and Infrastructure to determine the procedures and principles for dredging activities to be carried out in sea and inland waters in our country. This By-Law covers the dredging activities carried out in the sea and inland waters, the related works and procedures, the public institutions and organizations that carry out and have carried out the dredging work, and the real and legal persons and dredging vehicles.

Unauthorized sea bottom dredging activities of private and public institutions were prevented through the aforementioned By Law and prevention of the pollution that may occur in and around the sea by determining the spill areas in coordination has been aimed with the Ministry of Environment and Urbanization. Administrative sanctions are applied to those who dredge or spill without permission under this By-Law. These sanctions are fines, suspension of the Dredging Authorization Documents given to the companies, and the suspension of the dredging activities. The purpose of these sanctions is to protect our seas and inland waters against possible pollution and to prevent commercial losses by opening the way for sustainable dredging activities.

Furthermore, the Regional Directorates of our Ministry and Port Authorities were included in the permit procedure and the intervention of the relevant administrative institutions was accelerated in case of an emergency under the aforementioned By-Law. In addition to these issues, the dredging projects to be designed by the organizations will be prepared and information is obtained about the amount of spillage to be made and general issues regarding dredging.

C.1.3.1.4. Risk Management and Emergency Response Against Pollution Caused by Marine Accidents

Our country is defined as sensitive areas within the scope of the MARPOL agreement with its seas, high efficiency, economic value, ecological and biological structure. Pollution by oil and other harmful substances in our seas poses a great danger for Turkey, which has a long coastline in these seas and is on the crossing of the straits, due to the heavy traffic and strategic importance it carries.

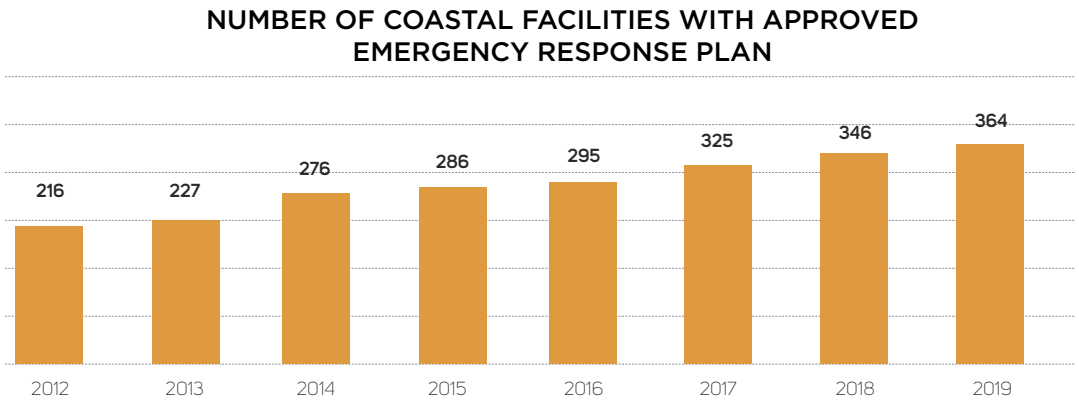
Turkey became a party to the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 90) and its Annexes prepared by the International Maritime Organization with a decree published in the Official Gazette N. 25233 dated 18.09.2003 within the scope of preparation, intervention, and legal responsibility for the pollution caused by marine accidents. Also, the Decision on Acceding to the 2001 International Convention on Civil Liability for Bunker Oil Pollution Damage entered in force after being published in the Official Gazette No. 25233 dated 18.09.2003. These conventions have provided a basis for National By-Laws.

"Law No. 5312 Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances" was published in 2005. An emergency response system was established in our country. And national and regional emergency response plans came into effect in 2012 within the framework of the law. Six regions have been determined so as to cover the coasts of the whole country, and the 28 provinces in these six regions have been prepared for emergency response. Efforts are underway to keep the plans up to date.

The preparation of the risk assessment and emergency response plans of coastal facilities covered by the law have been enabled so as to be integrated with national and regional plans prepared by the Ministry of Environment and Urbanization. Coastal facilities with high risk were determined and the approval of their emergency response plans was completed at the first step. In the second phase, coastal facilities with medium risk were determined and their approval processes are still in progress. As can be seen in Graph 20, the number of the coastal facilities, of which Emergency Response Plans were approved, reached up to 364 by the end of 2019.

Graph 20 - Number of Coastal Facilities with Approved Emergency Response Plan in Turkey

(Ministry of Environment and Urbanization, 2020)



12 companies/institutions/organizations have been authorized within the scope of the "Communiqué on the Selection of Companie / Institutions/ Organizations to be Given Emergency Response in Pollution of Marine Environment by Oil and Other Harmful Substances". Coastal facilities can fulfill their obligations regarding materials, equipment and personnel included in the emergency response plans approved by the Ministry of Environment and Urbanization, as well as procure services.

Again, pieces trainings and exercises with national and international validity are held in coastal facilities that have approved plans. Thus, the national capacity has improved within the scope of the preparedness efforts for the pollution of the marine environment by oil and other harmful substances as a result of the accident.

Our country has experienced important marine accidents in the past and faced major environmental disasters. Furthermore, we have obligations, within the scope of international maritime contracts (OPRC 1990, Barcelona and Bucharest Conventions) to which our country is a party, such as establishing a 24-hour emergency response system in our country, providing adequate emergency response equipment, and trained personnel, and establishing a regional structuring by developing cooperation protocols with neighboring countries. Also, the Ministry of Transport and Infrastructure has duties for being prepared for and responding to accidents within the scope of the "Law No. 5312 Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances".

National Center (National Maritime Safety and Emergency Response Center - Tekirdağ), 1 Regional Center (Regional Emergency Response Center-Antalya), and Response Stations were decided to be established within the scope of the "Establishment of Emergency Response Centers and Determination of the Current Situation in Our Seas Project" by the Ministry of Transport and Infrastructure. Concerning that; the construction of the center and the stations was completed and the promotion organization of the National Maritime Safety and Emergency Response Center, of which operation was transferred to the General Directorate of Coastal Safety on 03 August 2017, was held on 11 October 2019. Work has started to equip the facility with emergency response materials and equipment, and it is planned to be completed in 2020. Establishing emergency response stations along all our sea coasts and equipping them with the necessary personnel and equipment are planned for the upcoming period.

To determine the procedures and principles regarding the dredging activities to be carried out in the sea and inland waters in our country, "By-Law on Dredging of the Sea and Inland Waters" was published in the Official Gazette dated 09.08.2016 and numbered 29796 by the Ministry of Transport and Infrastructure and entered into force as of 09.02.2017. This By-Law covers the dredging activities carried out in sea and inland waters, the related works and procedures, the public institutions and organizations that carry out and have the dredging work, and the real and legal persons and screening vehicles.

The By-Law on Dredging of the Sea and Inland Waters was published in the Official Gazette No. 29796, dated 09.08.2016, and has entered into force as of 09.02.2017 by the Ministry of Transport and Infrastructure to determine the procedures and principles for dredging activities to be carried out in sea and inland waters in our country. This By-Law covers the dredging activities carried out in the sea and inland waters, the related works and procedures, the public institutions and organizations that carry out and have carried out the dredging work, and the real and legal persons and dredging vehicles.

Unauthorized sea bottom dredging activities of private and public institutions were avoided through the aforementioned By-Law, and it was aimed to prevent the pollution that may occur in and around the sea by determining the spill areas in coordination with the Ministry of Environment and Urbanization. Administrative sanctions are applied to those who dredge or spill without permission under this By-Law.

Administrative sanctions are applied to those who dredge or spill without permission under this By-Law. Furthermore, Regional Directorates and Port Authorities have been included in the permission

procedure, and the intervention of the relevant administrative institutions has been accelerated in case of an emergency. In addition to these issues, information is obtained on the number of spills and general issues regarding the dredging by ensuring the preparation of the dredging projects to be designed.

C.1.3.1.5. Aquaculture Activities

It is essential to establish fish farms in non-sensitive marine areas with appropriate capacity to prevent biodiversity loss and marine pollution by ensuring environmentally sustainable fish farming.

The "Communiqué on the Determination of Closed Bays and Gulf Areas as Sensitive Areas Where Fish Farms Cannot Be Established in the Sea" by the Ministry of Environment and Urbanization determined the sensitive areas where fish farms operating in coves and gulfs with high pollution potential cannot be established. With this Communiqué; the areas that are shallower than 30 meters and closer than 0.6 nautical miles from the shore, of which flow velocity is lower than 0.1 m / sec and eutrophication scale (TRIX) is higher than 4 are designated as sensitive areas, and fish farms in these areas are not allowed to operate per the Environment Law No. 2872.

Administrative and technical activities are carried out by the Ministry of Environment and Urbanization to ensure effective environmental management of fish farms operating in our seas. 162 fish farms in our country have been moved to suitable sea areas under this arrangement and thus, the pollution of bays and gulfs has been prevented and a healthy and sustainable production has been ensured.

C.1.3.2. Environmentally-Friendly Programs for Seas

C.1.3.2.1. Blue Flag and Bathing Water Program

Blue Flag is an international environmental award granted to qualified beaches, marinas, and yachts that meet the required standards. Our country started the Blue Flag application, conducted under the coordination of the International Foundation for Environmental Education (FEE) to prevent pollution of the sea by wastewater in beaches, marinas, and yachts, in 1993 under the leadership of the abolished Ministry of Tourism. The number of Blue Flags, as an indicator of clean seas, is increasing rapidly, owing to the activities carried out to prevent marine pollution in our country.

The Blue Flag award is granted for a year, and the Blue Flag Program supports sustainable development in swimming water areas. At the same time, it gives responsibilities to local governments and beach

businesses to reach high standards in bathing water quality, environmental management, environmental education, and safety.

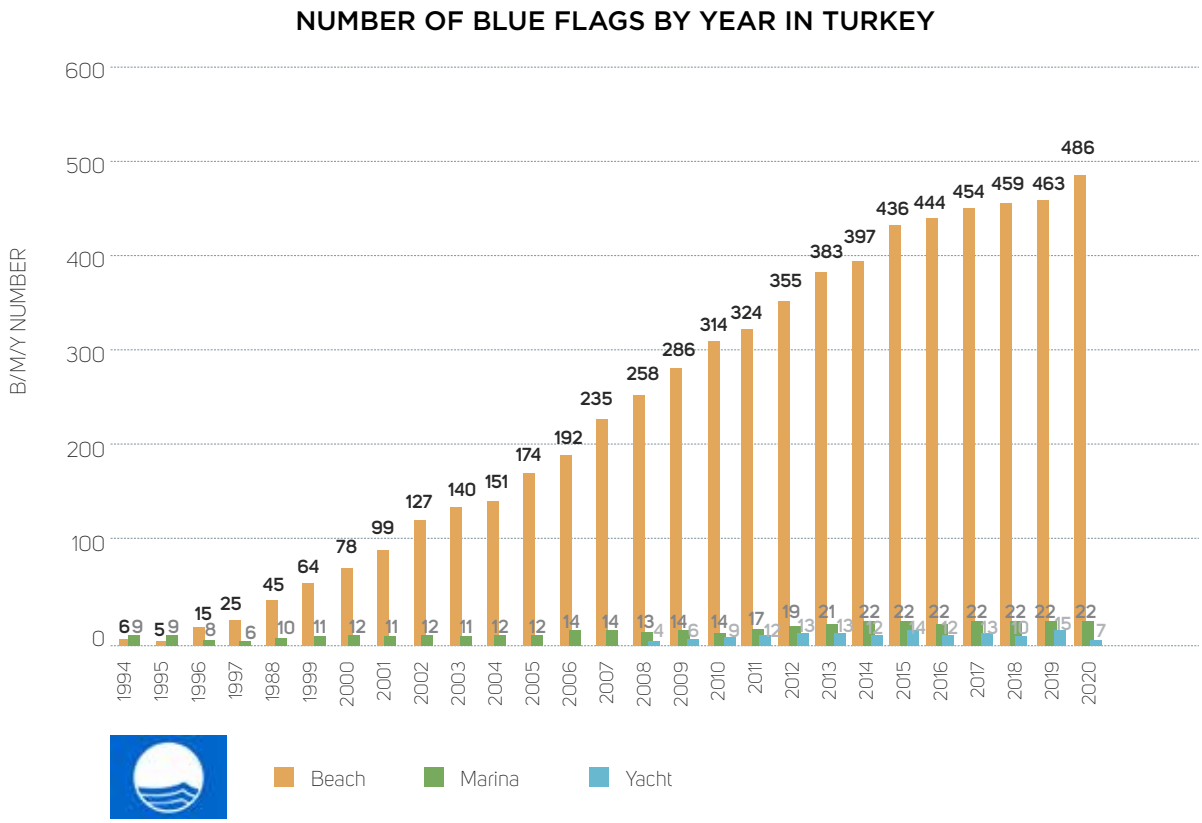
Today, the Blue Flag has become an important eco-label that brings together the tourism and environment sectors at the local, regional and national levels. The Blue Flag Program has an important role in the protection of the coasts, the development of environmental awareness, and tourism marketing. Although it is an environmental award, it is of great importance in terms of the tourism sector, as it has the feature of international standard and its application area is coastal.

There are 33 for beaches, 38 for marinas and 4 criteria, and 17 rules of behavior for individual yachts under the Blue Flag application. Samples are taken from swimming water areas every 15 days during the swimming water season for controlling the water quality, and analyzes are made at the microbiological level within the scope of these criteria. The allowance for microbiological analysis is transferred from the Ministry of Culture and Tourism to the Ministry of Health every year within the scope of the Blue Flag Program. The water quality data obtained as a result of these analyzes are evaluated within the scope of the By-Law on the Management of Bathing Water Quality and swimming water areas are classified according to their quality.

In the Blue Flag process, the places that are determined to meet all the criteria are entitled to receive the Blue Flag for one year with the approval of the national jury and then the international jury.

As can be seen in Graph 21, the number of Blue Flags in Turkey increased steadily between 1994 and 2020 and reached up to 486 beaches, 22 marinas, and 7 yachts as of July 2020. As of July 2020, Turkey ranked 3rd after Spain (590) and Greece (497) among 49 FEE member countries with Blue Flag application in terms of the number of Blue Flag beaches.

Graph 21 - Number of Blue Flags in Turkey
(Ministry of Culture and Tourism, (mavibayrak.org.tr) July 2020)



Our country has overtaken many leading countries in world tourism as a result of achieving a qualified tourism target and focusing on efforts to become a "brand country" at the international level within the framework of the principle of protecting the environment and nature of tourism resource. It is aimed to make this distinguished success of our country sustainable through the environmental policies implemented by the Ministry of Culture and Tourism. So, the Ministry of Culture and Tourism has prepared an Action Plan for increasing and protecting the Blue Flag number within this scope.

Furthermore, the Ministry of Culture and Tourism identifies and programs the technical infrastructure needs to serve the tourism sector especially the Culture and Tourism Protection and Development Regions and Tourism Centers, which are declared within the scope of the Tourism Incentive Law no 2634, and prepares, implements, or has implemented, the necessary surveys and projects of those. Moreover, evaluating and providing support for the projects and appropriation requests from the local administrations (Municipalities, Special Provincial Administration, Local Administration Unions), and the Investment Monitoring and Coordination Directorates of the provinces with tourism potential are among the responsibilities of the Ministry of Culture and Tourism.

In line with this, the number of our Blue Flags increases, depending on the infrastructure works carried out to improve the swimming water quality.

On the other hand, By Law Concerning the Management of Bathing Water Quality entered into force by being published in the Official Gazette No. 30899 dated 25.09.2019 to ensure effective management of swimming water areas and comply with the Directive 2006/7/EC of the European Parliament and the Council concerning the management of bathing water quality.

Many studies and projects are carried out by the Ministry of Environment and Urbanization and local administrations for protecting the marine environment in our country. The leading of these efforts are; the wastewater treatment plant investments made by local governments, most of the financial and technical support of which was provided was provided by the Ministry of Environment and Urbanization, "Project on Determination of Bathing Water Profiles in Turkish Coastal Beaches" conducted by the Ministry of Environment and Urbanization and the inspections made for the pollution sources determined within the framework of the profiles.

The objective is to increase the number of Blue Flags in our country through the effective studies carried out by the Ministry of Culture and Tourism and the Ministry of Environment and Urbanization.

C.1.3.2.2. Environmentally-Friendly Accommodation Facility Certificate

It is one of the important objectives of our country to support the development of tourism with sustainable environmental policies, to protect the environment. The Ministry of Culture and Tourism initiated the "Environmental Sensitivity in Tourism Campaign" in 1993 within the scope of sustainable tourism to protect the environment, develop environmental awareness, to encourage and incent the positive contribution of touristic facilities to the environment.

Environmentally-friendly accommodation facility certificates and plaques were started to be presented under "the Communique for the Certification of Environment-friendly Tourism Establishments, no: 2008/3", which was prepared by taking into account the EU Eco-label criteria and internationally accepted criteria and entered into force after being published in the Official Gazette No. 27005, dated 22.09.2008. Later, "the Communique for the Certification of Environment-friendly Tourism Establishments" was put into effect after being published in the Official Gazette No. 30101, dated 19.06.2017, in line with the developments in the sector.

The purpose of the Communiqué is to regulate the procedures and principles regarding the evaluation of the activities carried out by the facilities within the scope of sustainable tourism in terms of protecting the environment, increasing environmental awareness, encouraging and incenting their positive contribution

to the environment as well as the environmental consciousness. The number of Environmentally- Friendly Accommodation Facilities is 473 as of 08.07.2020, the number of rooms is 142,428 and the number of beds is 304.136 according to the statistical data announced by the Ministry of Culture and Tourism.

C.1.3.3. Legally Protected Marine Areas

The decision of the United Nations Environment Program (UNEP), on including the protection of the Mediterranean among its priority targets, resulted after the Mediterranean Action Plan (MAP) was developed in 1975 with the participation of the Mediterranean riparian countries and the EU.

"The Convention for the Protection of the Mediterranean Against Pollution (The Barcelona Convention), prepared to form the legal basis of the activities to be carried out within the framework of the MAP, was opened for signature in Barcelona on February 16, 1976. The Barcelona Convention was expanded to cover coastal areas as well as the marine environment in 1995, renamed "The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean", and entered into force on June 9, 2004.

Our country has become a party to the new arrangement of the Barcelona Convention, approved by the Council of Ministers on 7.12.1980, as of 2002. "The Protocol concerning Specially Protected Areas in the Mediterranean", which is one of the protocols annexed to this contract, has been renewed as "The Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean" and its content has been expanded.

In this context, the areas whose names are given below are declared as Specially Protected Environment Areas and they are legally protected marine areas. Detailed information on these areas can be found in "E.3.1. Specially Protected Environment Areas" section.

- Belek Specially Protected Environment Area
- Datça-Bozburun Specially Protected Environment Area
- Foça Specially Protected Environment Area
- Gökova Specially Protected Environment Area
- Fethiye- Göcek Specially Protected Environment Area
- Kaş- Kekova Specially Protected Environment Area
- Göksu Delta Specially Protected Environment Area
- Köyceğiz- Dalyan Specially Protected Environment Area
- Saros Bay Specially Protected Environment Area
- Patara Specially Protected Environment Area
- Finike Submarine Mountains Specially Protected Environment Area
- Karaburun-Ildır Bay Specially Protected Environment Area

C.1.3.4. Integrated Pollution Monitoring in Seas

The countries with a coast have signed contracts by developing joint research programs to protect the seas against pollution since the 1970s. The first joint venture for Mediterranean countries has been the signing of the Barcelona Convention for the reduction of pollution and then the implementation of the International Programme for the Assessment and Control of Marine Pollution in the Mediterranean (MEDPOL) has been accepted. Similar studies have been developed by the countries neighboring the Black Sea and so, the Black Sea Strategic Action Plan has been prepared. Within this scope, the Black Sea Integrated

Monitoring and Assessment Program (BSIMAP) has been established. The obligation to establish pollution monitoring programs at the national/international level has been imposed on the participating countries within the framework of these programs.

It is envisaged to determine the changes in the water quality of the coastal regions that are affected at different levels from the land-based pollutants in our seas and to evaluate the risks and socio-economic impacts of human-caused pollution on the marine ecosystem, with the monitoring programs.

The eutrophication caused by land-based pollutants, increased in the Black Sea and Marmara after the 1970s, has created new irreversible ecological features in these seas. Similar eutrophic conditions have been observed since the 1970s, especially in the Adriatic, Aegean, and Baltic seas. In this context, attempts to carry out coastal and marine monitoring activities in an integrated and regular manner have gained acceleration and an ecosystem-based management approach and an integrated monitoring approach have been introduced under the EU Water Framework Directive (WFD), which brought an integrated approach to basin management and monitoring in the 2000s and the EU Marine Strategy Framework Directive (MSFD), which aims to bring European seawaters to "Good Environmental Status" by 2020 approach.

Monitoring studies, which were being initiated in the 1990s in our country, have been combined with an integrated and ecosystem-oriented approach in 2011 and started to be carried out under the name of "Integrated Marine Pollution Monitoring Program (DEN-İZ)". Under the national marine monitoring program; marine monitoring studies have reached an integrated and ecosystem-oriented approach by adopting the strategies of the EU Water Framework (2000/60 / EC) and Marine Strategy Framework Directive (2008/56 / EC). Monitoring and evaluations are made in identified coastal water bodies and marine evaluation areas within the program which was developed and designed with WFD and MSFD. it has been in progress regularly in three-year periods without any data interruption since 2014.

A regular monitoring network, in 353 points and 173 areas together with 14 research institutes and 3 research ships, is established in all our seas with DEN-İZ under the supervision of the Ministry of Environment and Urbanization and the coordination of TÜBİTAK-MAM. The chemical and ecological status of our seas are determined and, the effectiveness of the measures and compliance with national and international legislation is evaluated through this network. Furthermore, the requirements of Conventions of the Barcelona and Bucharest Maritime to which our country is a party are fulfilled. A basis is formed for the determination of national marine and coastal management policies and strategies via regular monitoring of the pollution occurring in all our seas.

Specific indicators in biodiversity, commercial seafood, food web, eutrophication, seafloor integrity, hydrographic characteristics, pollutants ,and marine litter are monitored in seawater, seafloor, sediment, and biota under the monitoring program.

The reliable data, of which quality control (QC) and quality assurance (QA) studies are conducted, is produced with the program and reported to MEDPOL, the Black Sea Commission Secretariat, EEA, and national institutions. The program was created according to the descriptors of the WFCD Good Environmental Status (GES) to make it compatible with the WWFD and Integrated Monitoring and Assessment Programme of the Mediterranean Sea (IMAP) and new components were added.

These new components comprise zooplankton, seagrass monitoring, and beach litter monitoring included in the marine litter descriptor. Also, pressure and impact analyses have been carried out since 2017, and a real-time monitoring system has been established in the Gulf of İzmit, which has a high level of pollution, and the outer gulf has been monitored since 2018.

The 2017-2019 monitoring program studies and current monitoring network, which reached up to 353 stations as seen in Map 10, were completed. The marine monitoring and evaluations of the 2020-2022 DEN-İZ program have been initiated with the 2020 winter monitoring. And relevant studies are still in progress.

II. Symposium of National Marine Monitoring and Assessment on held on 3-14 December 2019 to share and disseminate the results obtained from the marine monitoring activities of the 2017-2019 monitoring period with a wider audience within a scientific activity, and to create a national platform where they can be evaluated together with other scientific findings and recommendations that can support these studies.

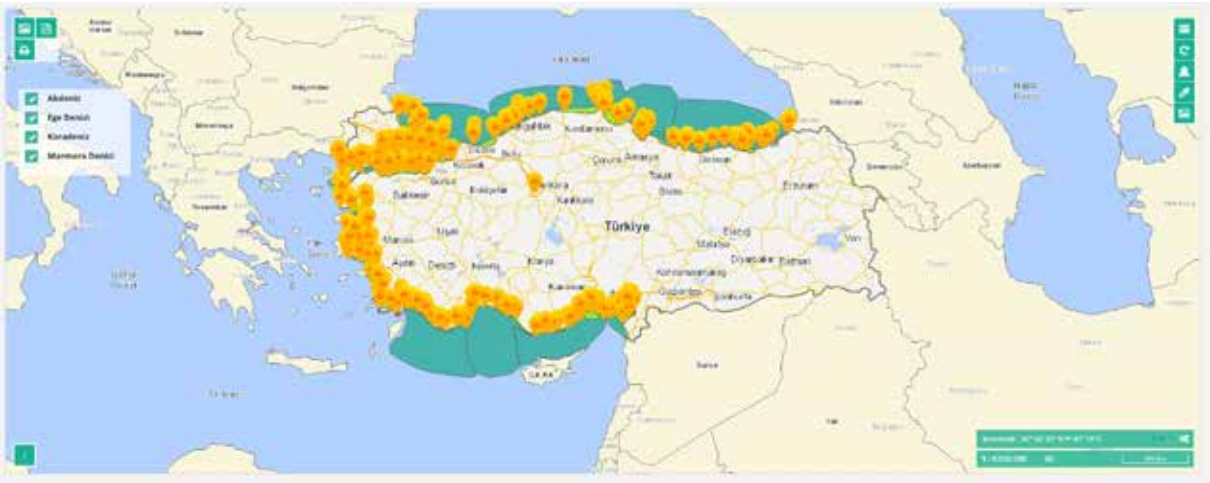
Ecological quality status assessments in which biological parameters (as phytoplankton (as Chlorophyll-a), macro flora and benthic invertebrates and supporting parameters (nutrients, TP, NO_x (NO_3 + NO_2-N) and SDD) are evaluated together in compliance with the Water Framework Directive of the Water Management Units (WMU) within the scope of Integrated Marine Pollution Monitoring Program. The classification map for 2019 is shown in Map 11 according to WFD color codes. Blue color represents very good quality, green represents good quality, yellow represents medium, orange is poor and red color represents bad ecological quality.

As seen in Map 11 in 2019; the quality of 1 WMU in the Mediterranean was "poor" (AKD05: Mersin Inner Bay) and 5 WMUs (AKD04_1: Karataş, AKD04_2: Karataş - Mersin East Entrance, AKD06: Outside of Mersin Bay, AKD08: Silifke, AKD09: Taşucu) quality is "medium". Other WMUs with "good" quality are AKD01 (Yayladağ - Samandağ), AKD02 (İskenderun Inner Bay), AKD07 (Erdemli), AKD10 (Gülnar-Anamur), AKD11_2 (Manavgat - Antalya), AKD14 (Kaş Kekova ÖÇK), AKD18 (Fethiye Göçek ÖÇK) and AKD19 (Dalaman-Ortaca). The quality of the remaining 6 WMUs (AKD03: Outside of İskenderun Bay), AKD11_1 (Gazipaşa - Manavgat), AKD12 (Kemer), AKD15 (Kekova SPEA West - Patara SPEA) and AKD17 (Fethiye Göçek SPEA) are "very good".

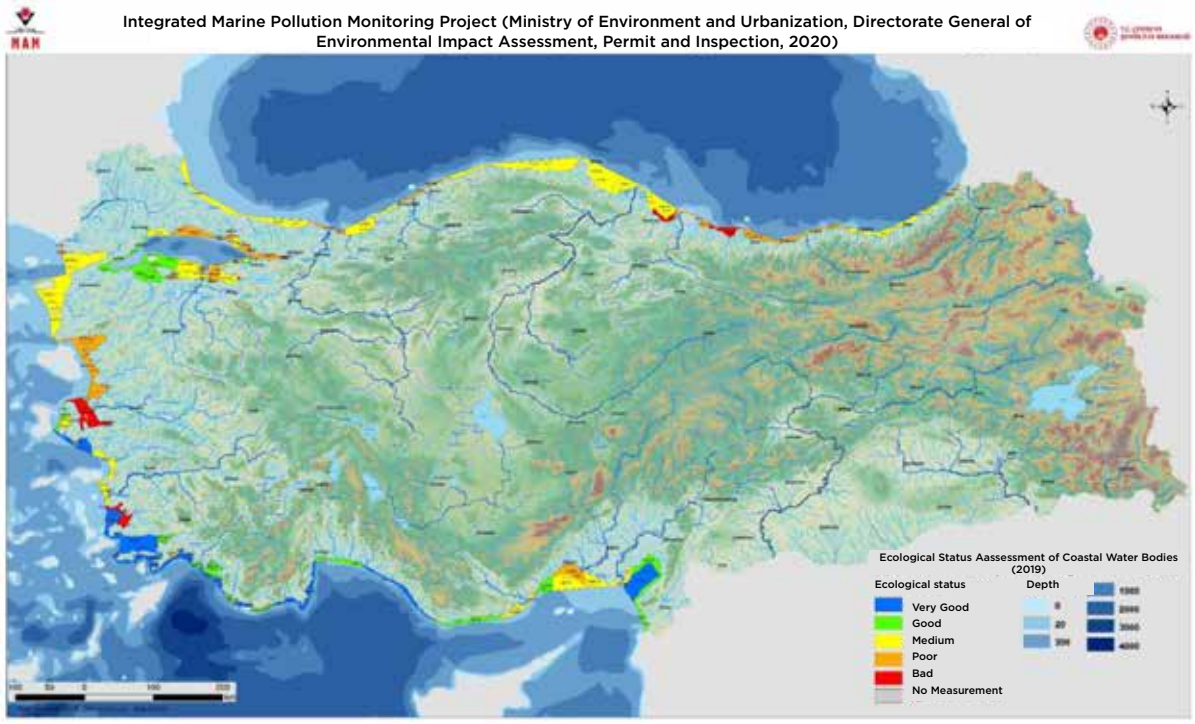
A decrease in quality was observed in the Aegean Sea in 2019, compared to the previous periods, especially in the northern and central parts. This deterioration is due to the chlorophyll-a parameter and it is thought that it may have been caused by meteorological factors depending on the period conditions. This situation is also valid for the Black Sea. It has been observed that the interior of the Güllük Bay (EGE05_1), the İzmir Bay-Gediz (EGE09_2), and the İzmir Bay interior are ecologically in poor condition. Foça SPEA, Çandarlı Bay, Dikili, Edremit Bay (EGE11, EGE12, EGE13-1, EGE13,2), and EGE16_2 located under the impact of Meriç have poor ecological quality.

Çanakkale Strait, and Bozcaada (EGE14,15), Saros Bay, and Gökçeada (EGE16_1), coastal area (EGE07_1) under the impact of Little Menderes Marmaris Coasts (EGE22), and Outfall of Greater Menderes are of medium quality. The status of other WMUs is evaluated as "good / very good".

Map 10 - Monitoring Points for Integrated Marine Pollution Monitoring Study (Ministry of Environment and Urbanization, 2020; sim.csb.gov.tr)



Map 11 - 2019 Ecological Status Assessment of Coastal Water bodies (Ministry of Environment and Urbanization, 2020)



The Ecological status of Our Black Sea coasts was generally medium and poor quality in 2019. The quality of 6 WMUs is "poor" (KAR02: Sakarya, KAR10: Yesilirmak, KAR12: Ordu, KAR13: Giresun, KAR16: Hopa) and the quality of many WMUs is "medium". KAR08 (Samsun) and KAR11 (Fatsa) are 2 WMUs with bad" quality. WMUs located on other coasts are evaluated as "medium" quality.

According to the 5-class evaluation of the WFD in the Marmara Sea in 2019; the majority of the WMUs are of medium and below ("poor / bad") quality. Erdek Bay, Kapıdağ regions, and Şarköy / Tekirdağ sides (MRM05, MRM06, MRM07, MRM08) were determined in good / very good quality. The coasts affected by the dynamics of Istanbul and the Bosphorus are located in the WMUs numbered MRM11, MRM13 and MRM14 and are of medium and poor ecological quality. The ecological quality of Bandırma Bay, İzmit Bay, Küçük Çekmece and Tuzla regions (MRM04, MRM15, MRM16, MRM17, MRM19_2) was found to be "poor / poor" in 2019. All of these water management units (MRM01, MRM02, MRM03, MRM20, MRM21) representing the gap with the outfall of Susurluk, east and west have been evaluated as risky areas as in the previous periods and their qualities are generally considered as "medium / poor".

C.1.3.5. Seawater Temperatures

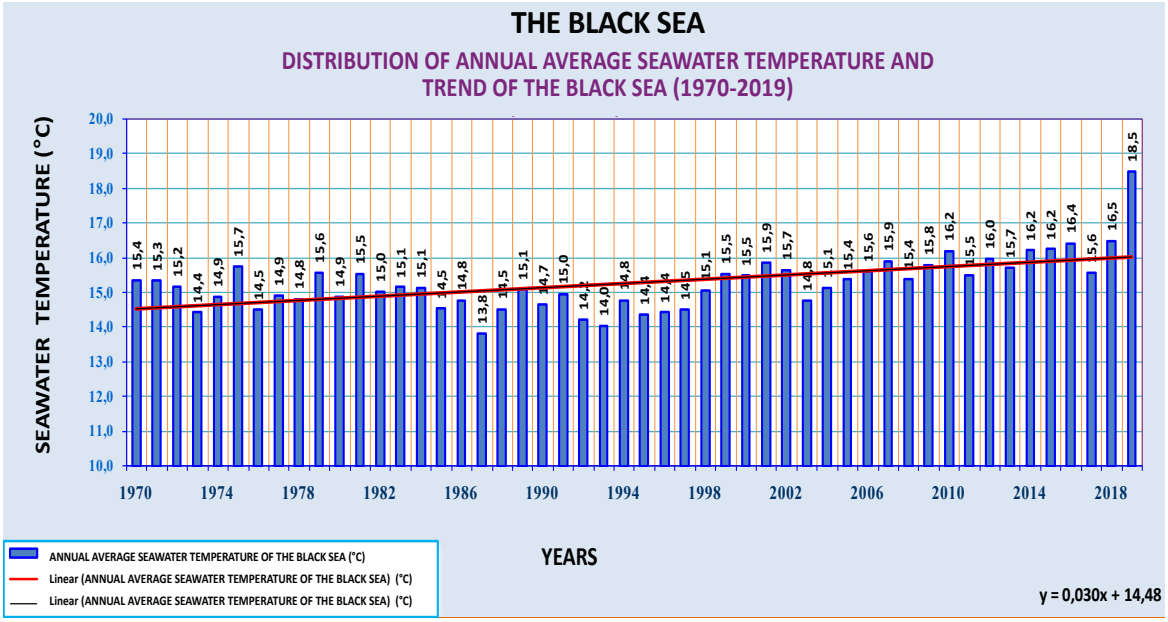
The main source of atmospheric weather events and air masses are oceans and seas. The most accurate indicator of climate change is the warming and cooling of seawater. The warming or cooling of the seawater affects many living creatures by changing the ecological structure of the seas, and it is closely related to an important segment that benefits from the seas economically.

Although there has been a slight increase in average seawater temperatures for many years in Turkey according to the data of the General Directorate of Meteorology, it is not right to talk about warming on a global scale at this stage.

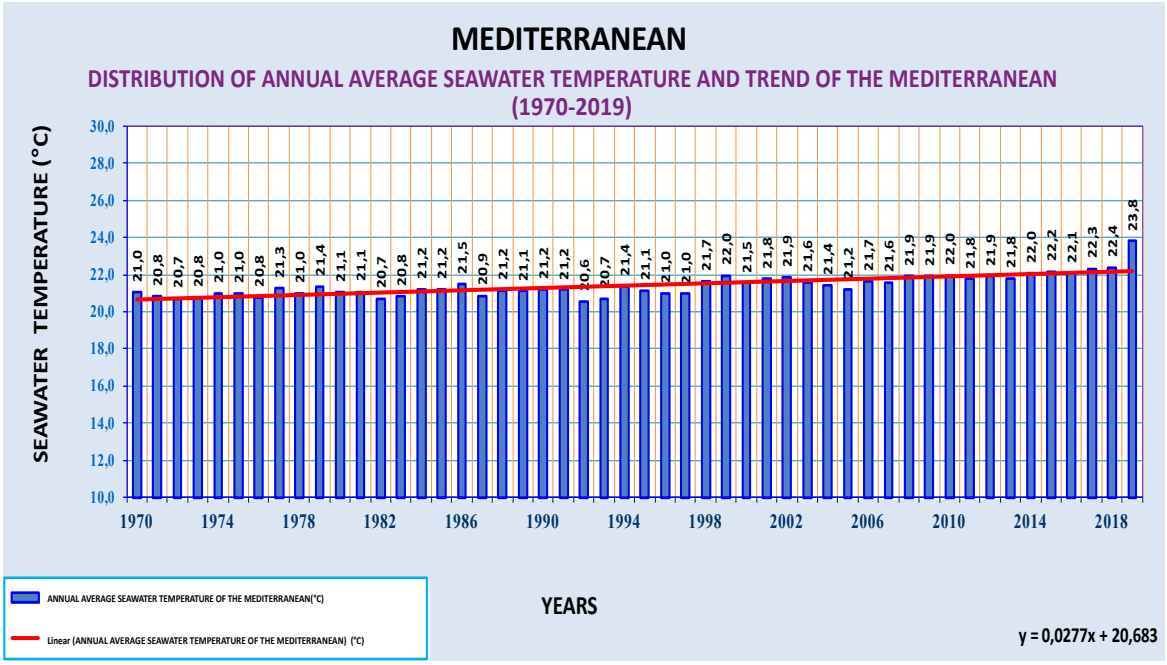
The General Directorate of Meteorology carries on the seawater temperature measurement studies on all our coasts so as to cover all our seas to monitor this process. Thus, a higher resolution data source about our seas will be obtained.

The average seawater temperatures in 2019 were 23.8 ° C in the Mediterranean, 19.1 ° C in the Aegean Sea, 18.6 ° C in the Marmara Sea, and 18.5 ° C in the Black Sea. The average annual seawater temperatures (as ° C) measured in the seas between 1970 and 2019 are given in the graphs below.

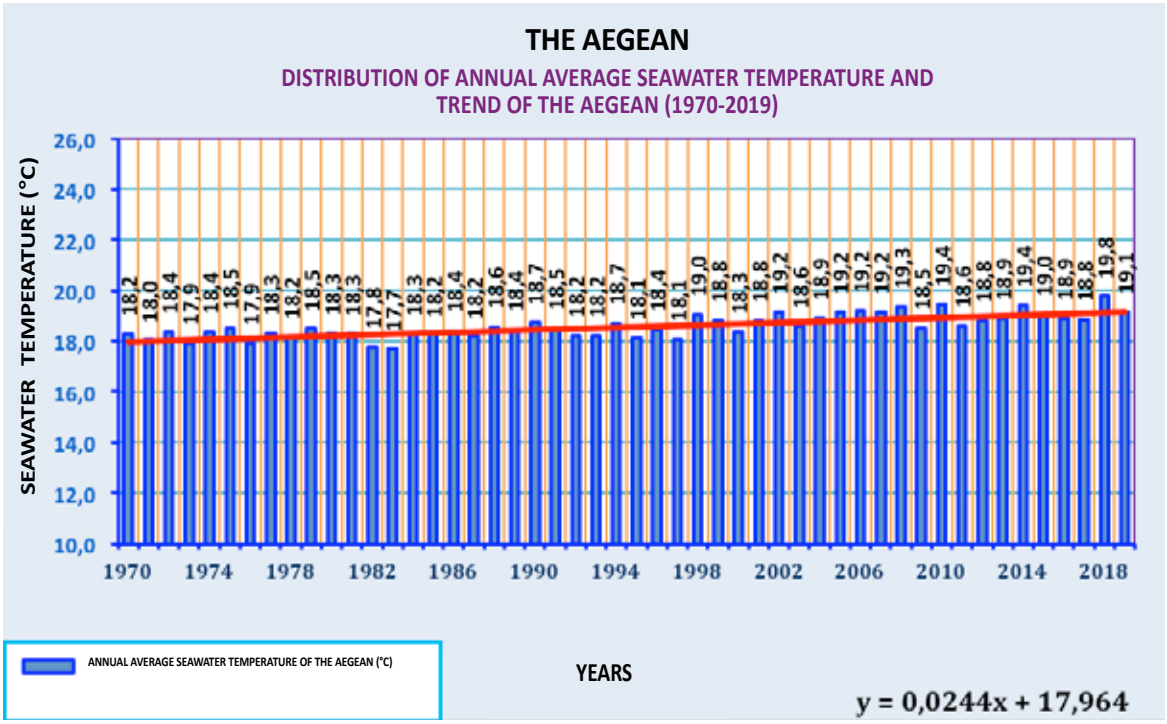
Graph 22 – Distribution of Annual Average Seawater Temperature and Trend of the Black Sea
(General Directorate of Meteorology, 2020)



Graph 23 – Distribution of Annual Average Seawater Temperature and Trend of the Mediterranean
(General Directorate of Meteorology, 2020)

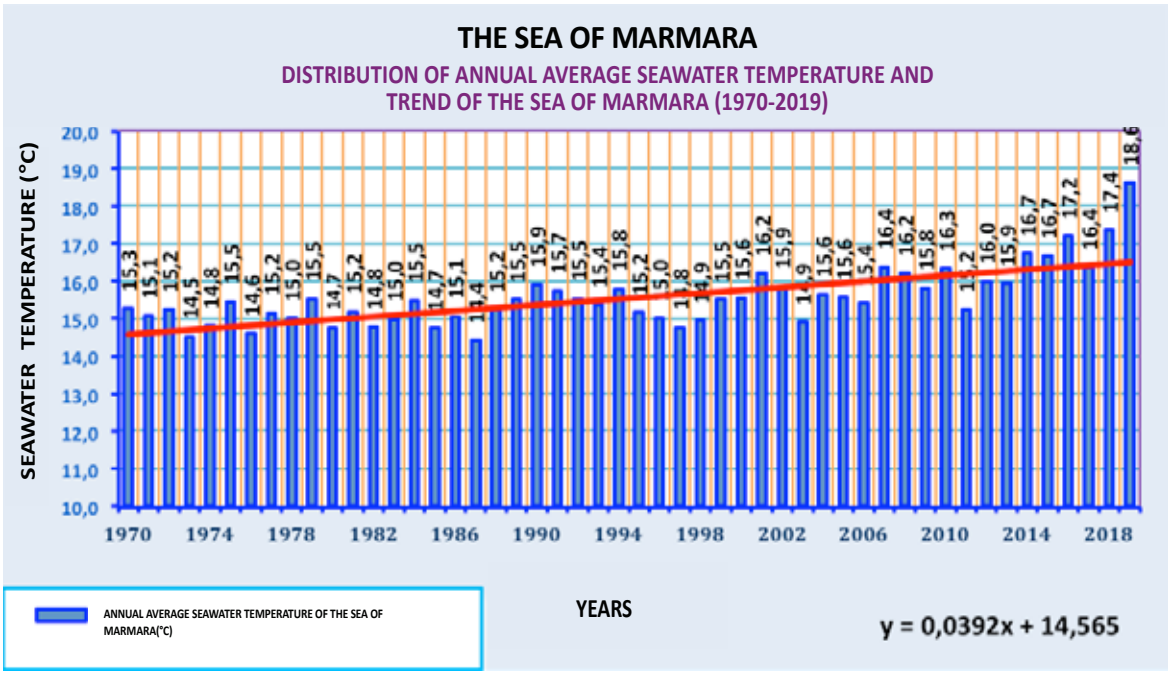


Graph 24 – Distribution of Annual Average Seawater Temperature and Trend of the Aegean (General Directorate of Meteorology, 2020)



Graph 25 – Distribution of Annual Average Seawater Temperature and Trend of the Sea of Marmara

(General Directorate of Meteorology, 2020)



C.1.3.6. International/Regional Cooperation in Combating Marine Pollution

As it is not enough to carry out studies on the protection of the seas against pollution by a single country with the same sea coast, inter-country cooperation is needed on the protection of seas that countries have common benefits. For this purpose, regional cooperation agreements have been signed between countries to prevent pollution of the marine environment, reduce and control pollution, and ensure sustainable use of natural resources.

These are the Convention on the Protection of the Black Sea against Pollution (Bucharest), to which the countries with coasts to the Black Sea including our country are a party, and the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona) to which the countries with coasts to the Mediterranean including our country are a party. The cooperation studies are carried out between riparian countries to protect the Mediterranean and Black Sea marine environment and to ensure its sustainable use under these conventions. In this context, measurements and analyzes are carried out in all our seas, to monitor the pollution occurred and to form a basis for the determination of national marine and coastal management policies and strategies. So, the pollution monitoring data and evaluations are reported within the framework of these conventions. Our country hosts the Permanent Secretariat of the Black Sea Commission. The activities of the advisory groups, national focal points, and activity centers established under the agreement are monitored.

The parties are requested to update their land-based pollutants action plans they have prepared before to ensure the implementation of "the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (LBS Protocol)" under the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona) and Strategic Action Programme (SAP MED). "The project for Updating the National Action Plan to Combat Marine Pollution from Land-based Activities" (2016-2017) was conducted with the TÜBİTAK-Marmara Research Center between 2016-2017 to update the "National Action Plan for the Protection of the Marine Environment from Land-based Activities" prepared by the Ministry of Environment and Urbanization in 2005. In favor of this project; the Land-Based Pollutants National Action Plan to achieve a "Good Environmental Status" in our seas, the Marine Strategy Framework Directive, and the Ecosystem Approach have been updated by taking into account the Barcelona Convention and the Bucharest Convention on Land-Based Pollutants Protocol and all measures needed to reduce land-based pollution are determined for all our seas. The subject studies were addressed so as to cover 18 Coastal Basins by taking into consideration Eutrophication, Pollutants, and Marine Litter, which are the objectives of the ecosystem-based approach, and the National Action Plan has been updated so as to cover the years 2016-2025.

On the other hand, it is obligatory to prepare a "National Border Budget" by the parties to meet the reporting requirement and to see the tendency of the pollutant loads within the framework of the obligations of the Barcelona Convention - Land-Based Pollutants Protocol.

In this context, the first step of a series of national and international projects carried out in the Mediterranean-Aegean coastal basins under the support of the UNEP Mediterranean Action Plan Secretariat and the coordination of the Ministry of Environment and Urbanization was carried out by the TÜBİTAK-MAM Environment Institute in 2003. The reports were updated with the studies of "National Border Budget 2008 (NBB 2008)" and "National Border Budget 2013 (NBB 2013)", respectively within the framework of this study that should be done every five years. The fourth stage update study with the title of National Border Budget 2018 (NBB 2018) was carried out between 2018-2019 with the support of the Barcelona Convention Secretariat within the scope of the studies of TÜBİTAK / MAM Environment and Cleaner Production Institute experts, and the report was submitted to the relevant Secretariat. The decision was taken to register the name of the "Environment-Friendly Cities Award" as "Istanbul Environment-Friendly City Award and accepted by all countries at the 19th Ordinary Meeting of the Contracting Parties to the Barcelona Convention held in 2016. The first of this internationally important awards was given to our

country at the 20th Ordinary Meeting of the Contracting Parties. Receiving the award of "Environment-Friendly Cities" as the "Istanbul Award" has provided our country with prestige.

Our country has been elected as the bureau member of the Secretariat for the years 2020-2021 and the 22th Ordinary Meeting of the Parties has been decided to be held in Antalya at the 21th Meeting held in 2019.

The Capacity Building on Marine Strategy Framework Directive in Turkey Project (MARinTURK) was conducted between the years of 2016-2018 performed through the support provided from the Financial Instrument for Pre-Accession (IPA) funds within the framework of the legal harmonization in the EU.

Under the project in question; the current situation for the implementation of the Marine Strategy Framework Directive in our country were determined, a need analysis was made with a gap analysis, the first assessment report was prepared for our seas, the "good environmental conditions" regarding the seawaters of our country were defined and the environmental targets required to achieve this situation were determined.

The "Project on Marine Environment Strategy Development for Turkey " was initiated in 2018. It is aimed to prepare a "National Marine Environment Strategy Document and a National Marine Environment Management Action Plan" that includes policies, measures, and targets to achieve a good environmental status in our seas with the project planned to be completed in 2021.

The By Law on the Implementation of the Environmental Protection Protocol in Antarctica, prepared within the framework of the transposition of the Environmental Protection Protocol, which is the annex protocol to the Antarctic Treaty, was published in the Official Gazette No. 31154, dated 13.06.2020.

C.1.3.7. Deep-sea Discharge

The dilution and modeling criteria specified in the By-Law on Water Pollution Control must be complied with in the deep-sea discharge of industrial wastewater (cooling waters, concentrated salty waters, etc.) with a wastewater capacity of more than 5,000 m^3 / day. Furtherome, it is required to apply to the Ministry of Environment and Urbanization for approval of the project within the scope of the Circular on Approval of the Projects of Wastewater Treatment Facilities and Deep-sea Discharge.

On the other hand, for the discharge of industrial wastewater with a wastewater capacity less than 5,000 m^3/ day into the sea; discharging can be done from the shore by enabling dilution at the circular boundary with a radius of 75 meters from the discharge point, excluding bathing water areas.

C.2. Quality of Water Resources

The main approach in protecting water resources should be to prevent pollution. Measures to be taken after the resources are contaminated are more difficult and expensive. The excessive use of natural resources, untreated domestic and industrial wastewater running down to water resources as a result of unplanned and rapid industrialization and unplanned urbanization, insufficient capacity, and process of existing wastewater treatment facilities, inefficient transmission, and agricultural activities are among the main reasons for the deterioration of the quality of Turkey's water resources.

Water quality monitoring activities have been carried out in 25 river basins in our country by the General Directorate of State Hydraulic Works (SHW) since the 1970s. Monitoring programs covering the biological, chemical, physicochemical, and hydromorphological quality elements have been prepared in accordance with the requirements of the European Union Water Framework Directive to carry out the monitoring studies with a certain standard and to obtain long-term, healthy water quality monitoring data of 2014. Monitoring studies are carried out by the General Directorate of State Hydraulic Works within the scope of these monitoring programs.

The Ministry of Agriculture and Forestry carried out the "Project on the Establishment of the Water Quality Ecological Assessment System Specific for Turkey" within the scope of the efforts to establish an ecosystem. Biological, hydromorphological, and chemical monitoring studies were carried out at 226 points in rivers, lakes and coastal waters in 8 pilot basins (Lower Euphrates Sub-Basin, Western Mediterranean Basin, Ceyhan Basin, Aras Basin, Eastern Black Sea Basin, Western Black Sea Basin, North Aegean Basin, Sakarya Basin) under the project completed at the end of 2016 and the biological, chemical, and hydromorphological quality status and final water quality conditions of each monitoring point were determined. 226 monitoring points had been monitored for 1 year in 8 basins and accordingly; 4 points had very good, 37 points had good, 145 points had medium, 29 points had weak and 11 points had bad water status.

As a result of these, "the Project on the Establishment of Reference Monitoring Network in Turkey" was launched in December 2016 for the purpose of determining the reference areas of the 25 basins of our country (less degraded areas due to the natural and / or human effects). Within the context of the project; the biological, hydromorphological, and chemical monitoring studies were carried out in approximately 900 rivers, lakes, coastal and transitional water in 25 basins in 2017, 2018, and 2019, and the biological, chemical, and hydromorphological quality status and final water quality conditions of each monitoring point were revealed.

Accordingly, a total of 663 rivers, lakes, coastal and transitional water were determined as the reference areas in 17 basins (Antalya, Western Mediterranean, Büyük Menderes, Küçük Menderes, North Aegean, Susurluk, Konya, Gediz, Akarçay, Burdur, Meriç-Ergene, Marmara, Western Black Sea, Eastern Black Sea, Yeşilırmak, Kızılırmak, Sakarya) monitored in 2017 and 2018. Studies relevant to evaluation of the monitoring results in 8 basins monitored in 2019 (Eastern Mediterranean, Seyhan, Asi, Ceyhan, Fırat-Dicle, Çoruh, Aras, Lake Van Basins) are on progress.

Procedures and principles regarding the management with an ecosystem-based holistic approach have been laid down in line with the requirements of the Water Framework Directive (2000/60 / EC) of water resources under the "By-Law on Surface Water Quality Management" published in the Official Gazette No. 28483, dated 30.11.2012. This By-Law includes the procedures and principles regarding measures to be taken for determining and classifying the biological, chemical, physicochemical, and hydromorphological qualities of surface waters, including coastal and transitional waters, monitoring the quality and quantity of water, determining the usage purposes of these waters in line with the sustainable development goals, considering the balance of protection and protecting these waters and reaching the status of good water.

The aforementioned By-Law has been revised twice namely by the amendment made in the Official Gazette No. 29327, dated 15.04.2015 and that made in the Official Gazette No. 29797, dated 10.08.2016. The pollutants that might be present in our surface water resources as a result of urban, industrial, and agricultural activities were investigated in this context and 250 specific pollutants have been identified and determined, and the water quality criteria (environmental quality standards), regarding 250 specific pollutants determined and 45 priority substances included in the EU legislation and the substance that is specific to rivers and lakes, and coastal and transitional waters, have been transposed into national legislation.

The surface waters are classified according to the By-Law on Surface Water Quality Annex-5 Table-2 : "Quality Criteria for the General Chemical and Physicochemical Parameters of the Intra-continental Surface Water Resources According to their Classes".

According to the by-law, 4 water quality classes are defined for intra-continental surface water resources. According to this:

- Class I: High-quality water
- Class II: Lightly contaminated water
- Class III: Contaminated water
- Class IV: Refers to the very contaminated water situation.

The required quality criteria to be met for dissolved oxygen, total phosphorus, oxidized nitrogenous compounds, oil-grease, and floating substances relevant to the Aegean Sea, Mediterranean, Black Sea, and the Marmara Sea are given in the By-Law on Surface Water Quality regarding the quality assessment in terms of general chemical and physicochemical parameters related to coastal waters.

The eutrophication criteria for the Aegean and Mediterranean, Black Sea, Marmara coastal waters and for their lakes, ponds, and dam lakes, as well as the standard values that should be provided for the coastal and transitional waters used for recreational purposes, have been determined.

For implementing the practices within the scope of the By Law; the Ministry of Agriculture and Forestry completed a sample study in a pilot basin, regarding the calculation of the daily pollutant load that can be accepted without exceeding the targeted water quality in surface water resources to take necessary measures to reveal, protect and improve the quality of our surface water resources, in 2017. The discharge standards for urban wastewater treatment plants and industrial facilities in the pilot basin have been calculated, taking into account the daily maximum total load approach, to ensure the receiving environmental quality standards for certain pollutants, priority substances, and general chemical and physicochemical parameters in the Gediz Basin within the scope of the project. The discharge standards based on the receiving environment were determined to prevent water pollution, the method for ensuring their implementation throughout the country was set out and shared with the implementing institution, the Ministry of Environment and Urbanization.

Besides these studies, the studies were carried out to investigate in more detail the endocrine-disrupting chemicals that pose a risk especially to the aquatic environment and to ensure their effective management in surface waters. Within the scope of the study completed in 2018; the "Candidate National List of Endocrine-Disrupting Chemicals" was determined, monitoring studies were carried out in the receiving environment and pilot facilities, laboratory-scale studies were carried out to investigate the treatment technologies for the removal of endocrine-disrupting chemicals, and FRSs were determined for endocrine-disrupting chemicals. alarm levels and limit values for cyanobacteria and cyanotoxins were determined, removal efficiencies of Drinking-Water treatment plants were determined and guideline documents were prepared within the scope of a study completed at the end of 2016.

The environmental targets were determined to protect and improve the water quality, a methodology that can be applied in other basins was developed and a precautionary program was created for the pilot region within the scope of the work carried out for surface waters in the Büyük Menderes Basin and completed at the end of 2018.

"Communiqué on Determining Environmental Targets for Surface Water bodies" was prepared to establish the legal infrastructure of the said studies, regarding the determination of environmental targets, and entered into force by being published in the Official Gazette No. 31192, dated 21.07.2020. The procedures and principles for determining the environmental targets, that should be achieved to enable all surface water bodies, including coastal and transitional waters to reach a good condition have been laid down. The Communiqué includes provisions regarding the evaluation of ecological and chemical water quality conditions together and revealing the final water quality status, as well.

Regarding the assessment of water quality for lakes, ponds, and dam lakes; their trophic conditions are assessed by taking into account the limit values in the By-Law on Surface Water Quality. According to this; the most important factor threatening lakes, ponds, and reservoirs is eutrophication. The nitrogen and phosphorus loads reaching the receiving water environments should be classified to control the eutrophication problem.

For this purpose, the urban and nitrate sensitive areas that were polluted or are under the threat of pollution as a result of excessive accumulation of nitrogen and phosphorus compounds from urban and industrial wastewater and agricultural activities in 25 river basins have been determined as a result of the studies

carried out by the Ministry of Agriculture and Forestry and the mentioned areas covering 50 percent of our country's surface area were published under the "By Law on the Determination of Sensitive Water bodies and the Areas Affecting These Bodies and the Water Quality Improvement" (Official Gazette: 23.12.2016 / 29927) by determining the necessary measures to be taken for the improvement of water quality in sensitive water bodies. However, the pressures in terms of nitrogen and phosphorus were detected in 422 lakes, ponds and reservoirs, water quality and trophic conditions were revealed through monitoring studies measures for improving water quality were put forward by determining the water budget and absorption capacities.

Water quality action plans are prepared to improve the quality of water resources, which are particularly threatened by heavy pollution, and the progress of action steps is constantly monitored. Some of the action plans currently being implemented are "Uluabat Lake Water Quality Action Plan", "Mogan-Eymir Lake Sub-Basin Water Quality Action Plan", "Manyas Lake Water Quality Action Plan" and "Ilgın Lake Sub-Basin Water Quality Action Plan".

C.3. Sectoral Water Uses and Water Allocations

The utilization rate of 112 billion m^3 of available water resources in our country is still about 39% and 32 billion m^3 of this is used in irrigation, 7 billion m^3 is used for drinking and 5 billion m^3 is used in the industry. In this case, while 73% of our country's water resources are used for irrigation, 11% for industry, 16% for urban consumption, these rates are 70%, 22%, 8% in the world and 33%, 51% and 16% in Europe, respectively.

Table 53 - Amount of Water Drawn from Water Resources by Place of Use / Sector (Billion m^3 / year)

(TURKSTAT, 2020)

	2008	2010	2012	2014	2016	2018
Municipalities	4.56	4.79	4.93	5.23	5.83	6.19
Villages	1.22	1.01	1.04	0.43	0.38	0.39
Manufacturing industry workplaces	1.20	1.42	1.67	2.2	2.12	2.68
Thermal power plants	4.54	4.27	6.40	6.53	8.61	7.87
Organized industrial zones	0.11	0.11	0.12	0.14	0.15	0.16
Mining managements	(*)	0.05	0.11	0.21	0.23	0.24
Irrigation (1)	33.77	38.15	41.55	35.85	43.06	43.95
Total	45.40	49.75	55.71	50.38	60.15	61.24

(*) No data.

(1) SHW data. It is the sum of the total amount of surface water used in irrigation and the total amount of groundwater allocation for irrigation.

It is the sum of seawater and freshwater.

Turkey's land, which has a surface area of 78.5 million hectares (Turkish Statistical Yearbook, 2011), constitutes the cultivated agricultural lands. Of the 8.5 million hectares of land, 6.35 million hectares (gross) of which is economically irrigable, 6.35 million hectares, in other words 75%, has been opened to irrigation; 4.04 million hectares (gross) (64%) by SHW, 1.31 million hectares (gross) (20%) by the abolished General Directorate of Rural Services (GDRS) and 1 million hectares (gross) (16%) as public irrigation.

Table 54 - Summary Information of Water Allocation / Use (SHW, 2020)

Sector	Item	Sector	Item	Allocation Amount Distribution	l/s	h/m³	Total Allocation Water	9.748
Total Allocation water	9,748	Aquaculture	1,149	Valid Total	699,323,90	50,040,88	Cancelled Allocation Water	83
Drinking and Potable	2,791	Industry	199	Invalid Total	108,871,25	3,379,46	Valid Allocation Water.	6,448
Irrigation	4,642	Trade	665	Cancellation Total	6,385,80	199,37	Invalid Allocation Water	206
Energy	13	Other	23	Inspection Total	104,976,00	16,344,25	Inspection Allocation Water	3,011
				General Total	919,556,94	69,963,96		

Table 55 – Soil and Water Potential and Usage Status in Turkey (SHW, 2020)

Water Usage Areas	
Economically Irrigable Area (million ha)	8.50
Areas Built and Opened to Irrigation by SHW and Other Institutions (million ha)	6.65

C.3.1. Drinking and Potable Water

As water can be a direct cause of illness, it can set the stage for diseases or facilitate the occurrence of some diseases. Therefore, access to healthy and safe water is of great importance in protecting human health.

Table 56 - Data On Indicators of Drinking and Potable Water Use in Turkey (TURKSTAT, 2019)

	2014	2016	2018
Population of Turkey	77,695,904	79,814,871	82,003,882
Total number of municipalities	1,396	1,397	1,399
Total municipal population	72,505,107	74,911,343	76,888,607
Number of municipalities served by drinking and potable water networks	1,394	1,394	1,397
Municipal population served by drinking and potable water network	70,522,136	73,587,584	75,779,007
The ratio of the population served with drinking and potable water to the total municipal population (%)	97	98	99
Total amount of water drawn for drinking and potable water network (thousand m³ / year)	5,237,407	5,838,561	6,193,158
Dam	1,886,617	2,618,225	2,468,103
Well	1,423,751	1,563,154	1,740,116
Source	984,869	1,000,205	1,138,388
Stream	652,370	552,624	560,356
Lake-pond / sea[1]	289,800	104,354	286,196
The amount of surface water drawn for drinking and potable water supply (thousand m³ / year)	2,828,787	3,275,202	3,314,654

	2014	2016	2018
The amount of groundwater drawn for drinking and potable water (thousand m^3 / year)	2,408,620	2,563,359	2,878,503
Daily amount of water taken per person (liter / person-day)	203	217	224
The amount of water distributed by the drinking and potable water network (thousand m^3 / year)	3,394,545	3,732,875	4,045,486
Number of drinking and potable water treatment plants	381	519	629
Physical	69	54	22
Conventional	165	197	197
Advanced	147	268	410
Drinking and potable water treatment plant capacity (thousand m^3 / year)	5,346,014(r)	5,558,307(r)	6,023,791
Physical	148,052	115,489	31,000
Conventional	4,955,564	4,989,372	5,437,331
Advanced	242,398(r)	453,446(r)	555,461
The amount of water treated in drinking and potable water treatment plants (thousand m^3 / year)	2,995,001	3,350,389	3,574,058
Physical	47,875	33,653	3,677
Conventional	2,860,041	3,113,183	3,292,165
Advanced	87,085	203,553	278,216
Number of municipalities served by drinking and potable water treatment	436	436	443
Municipal population served by drinking and potable water treatment	41,610,124	43,881,160	46,229,893
The ratio of the population served with drinking and potable water treatment plants to the total municipal population (%)	58	59	60

(1) Includes water drawn from the sea since 2010.
(r) Revised.

C.3.2. Irrigation

According to the studies conducted in Turkey, 8.5 million hectares of land that can be irrigated economically have been determined, and 6.65 million hectares (net) area has been opened to irrigation. This area corresponds to of 78% the total economically irrigable land. The area opened to irrigation by SHW is 4.36 million hectares. 1.1 million hectares (net) were put into operation by the abolished General Directorate of Rural Services. Furthermore, approximately 1.19 million hectares (net-gross) area has been opened to irrigation by the public.

Table 57 - The Amount of Surface Water Used in Irrigation throughout Turkey, (km^3/ year) 2000- 2018 2000-2018

(SHW, 2020)

Years	The Amount of Irrigation Water Used in the Irrigation Site Built and Opened to Operation by SHW	Estimated Amount of Irrigation Water Used in Irrigation Area Opened to Operation by Other Institutions	Total Amount of Surface Water Used in Irrigation Across Turkey
2015	16.727	14.699	31.426
2016	17.694	15.530	33.224
2017	17.425	14.771	32.197
2018	18.693	14.796	33.490

(http://www.dsi.gov.tr/dsi-resmi-istatistikler/resmi-i-statistikler-2018/2018-y%C4%B1l%C4%B1-verileri)

Water and irrigation affect both agricultural production and human and public health in all aspects in arid and semi-arid climates, apart from climatic regions with sufficient rainfall levels. The overheating of the earth and drought, along with the changing climatic conditions, affect directly the water resources and consequently the agriculture sector at the very most. This also increases the aforementioned rate day by day. For this reason, it is of great importance to save water by increasing water use efficiency in irrigation. Saving in the amount of water used in agriculture will both enable irrigation of more land in agriculture and alleviation of water shortages in other sectors. Therefore, the use of tools and techniques that ensure effective water use in agriculture should be among the priority targets of our country.

The General Directorate of Agricultural Research and Policies (TAGEM), Water Resources Central Research Institute has carried out many studies, together with the studies carried out within the scope of R&D in the agriculture sector so far, regarding pressurized irrigation systems saving water, restricted irrigation programs, development of methods for preserving soil moisture in arid regions to reduce the risk of agricultural production, measures for moisture conservation in the soil (water harvest, runoff prevention, and other conservation measures), planning of alternative crop varieties, development of drought and salinity resistant plant varieties, determination of renewable use conditions of low-quality irrigation water (treated wastewater, tailwater returns from irrigation, etc.).

The General Directorate of Agricultural Research and Policies (TAGEM) took place as the responsible and relevant institution in the components of "Modernization and Optimization of the Existing Irrigation Infrastructure", "Increasing R&D Studies on New Techniques and New Practices in Irrigation", "Increasing Education and Extension of Agricultural Producers for Conscious Use of Water", Review of Support Policies Based on Water Limitation", for the period of 2015-2018 under the "Program on Water Use Efficiency in Agriculture" in the 10th Development Plan. National projects have been prepared to evaluate all methods that can be developed to increase the efficiency and saving of limited water resources, and the products that stand out in our product potential when the country's needs are taken into consideration and that are planned to be studied primarily in connection with plant water relations have been designed.

While the outputs of the projects conducted under the "Action for Investigation of Irrigation with Low-quality Water and Purified Water" included in the 10th Development Action Plan will contribute to the determination of irrigation water quality parameters and prevention of agricultural pollution, data will be delivered to the Water Information System of the Ministry of Agriculture and Forestry, as well.

C.3.2.1. Area of Flood Irrigation and Amount of Water Used

The amount of the area of flood irrigation and that of water used in Turkey is not precisely known. Since the controlled irrigation system cannot be applied in flood irrigation, the negative effects of irrigation on natural resources cannot be prevented. Incorrect irrigation practices with flood irrigation methods cause adverse effects on water and soil resources in terms of quantity and quality. Especially the groundwater level rises with flood irrigation in closed basins, the salt concentration in the soil increases as a result of evaporation in arid and semi-arid climates, and salinization occurs as a consequence. Since controlled irrigation can be done in pressurized irrigation methods, it is possible to prevent these problems.

C.3.2.2. Pressurized Irrigation Area and Amount of Water Used

There is no information for Turkey in general regarding the amount of area where pressurized irrigation methods are applied and that of water used. However, according to the 2018 data of the General Directorate of SHW, the sprinkler irrigation usage rate is 21% and the drip irrigation usage rate is 17%. According to the data obtained from the research studies, the total amount of water of the plants is given in the Irrigation Techniques Guide of the Cultivated Plants Grown in Turkey by specifying the irrigation methods according to the regions.

50% grant support and zero-interest loan application for investments in drip and sprinkler irrigation systems by the Ministry of Agriculture and Forestry for the efficient use of irrigation water are maintained. According to the 2018 data; drip and sprinkler irrigation system has been installed on a total area of 7.8 million decares.

"Technical Performance Evaluation of Drip Irrigation Systems Used in Turkey and Impact Analysis of Drip Irrigation Supports" was completed under the coordination of TAGEM to create data for the support policies through the Efficiency and Traceability of Pressure Irrigation Systems Support Policies.

Subsurface drip irrigation systems with high water usage efficiency, which are used extensively in countries where water is limited, continue to experiment with different products in different regions within the scope of the national project of "Creating Plant Irrigation Programs According to Irrigation Methods That Provide Water Saving in Restricted Water Conditions".

C.3.3. Industrial Water Supply

Table 58 - Manufacturing Industry Water Indicators (thousand m^3 / year) (TURKSTAT, 2019)

	2008	2010	2012	2014	2016	2018
Amount of the water drawn	**1,313,878**	**1,556,705**	**1,792,010**	**2,355,547**	**2,300,646**	**2,898,246**
City	33,052	47,342	31,835	34,173	38,770	42,198
Sea	658,650	821,324	1,169,631	1,665,570	1,548,976	2,064,711
Lake	16,372	14,152	11,717	16,125	8,498	12,668
Stream	54,523	64,220	62,181	63,139	47,064	41,317
Dam	79,435	98,353	86,835	82,276	99,796	103,696
Source / well	386,844	425,017	336,923	371,589	407,362	449,124
Tanker	12,496	13,523	7,451	8,793	7,812	7,355
OIZ network	68,086	62,366	69,863	89,185	107,596	139,162
Other (1)	4,420	10,408	15,574	24,697	34,772	38,016
The amount of water	**1,311,748**	**1,550,889**	**1,786,145**	**2,349,106**	**2,288,970**	**2,885,154**
Process water	352,743	390,091	329,840	345,727	425,623	489,730
Boiler water	43,736	37,259	29,520	36,601	37,677	52,971
Supplementary cooling water	777,463	970,751	1,301,611	1,817,076	1,684,799	2,202,695
Domestic water	76,271	102,031	67,182	83,886	86,004	87,123
Other (2)	61,535	50,756	57,992	65,816	54,868	52,635

(1) It includes water obtained from SHW irrigation channel, village network, free zone network, other workplaces, demijohn, water supply, and treatment service unions/companies, ponds, rainwater, etc.

(2) It includes the amounts of water used in other workplaces, air conditioners, firewater, garden irrigation, water preparation unit, car washing, road irrigation to prevent dust, wastewater treatment plant, etc.

C.3.4. Use of Water for Energy Production

Turkey's electricity consumption, which was 132.6 billion kWh in 2002, reached 303.7 billion kWh by 2019, and it is expected to be around 375.8 billion kWh in 2023.

The total installed electrical power of Turkey reached 93,023 MW as of 30 August 2020. In this context, the installed power distribution over fuel types as of the end of 2019 and 30 August 2020 is given in Table 59. Considering the information in Table 59, the share of renewable energy plants in the total installed power reached 50.32% as of 30 August 2020.

Dam and River Type Hydroelectric Power Plants had the most important share in Renewable Energy, which constitutes 31.66% of the total installed power as of the end of June 2020.

The Ministry of Energy and Natural Resources carries out strategy development, potential identification, study, measurement, feasibility, research and development, test and demonstration projects to determine the usable energy potentials for evaluating our country's hydraulic, wind, geothermal, solar, biomass, and other renewable energy resources considering the environmental effects, to reveal the methods of benefiting from these potentials, to disseminate their utilization and, to benefit from the advantages of these resources. In this context, it is clear that the negative pressure on climate change and water resources will decrease with the rapid increase in the share of energy production based on renewable energy resources.

Table 59 - Installed Power Distribution in Turkey
(TEIAS, 2020)

	AS OF THE END OF 2019			AS OF THE END OF AUGUST 2020		
FUEL TYPES	NUMBER OF POWER PLANTS	INSTALLED POWER (MW)	CONTRIBUTION (%)	NUMBER OF POWER PLANTS	INSTALLED POWER (MW)	CONTRIBUTION (%)
STREAM	558	7,860.5	8.6%	561	7,902.2	8.5%
ASPHALTITE COAL	1	405,0	0.4%	1	405,0	0.4%
WASTE HEAT	82	361,8	0.4%	84	369,6	0.4%
WITH DAM	124	20,642.5	22.6%	128	21,877.1	23.5%
BIOMASS	181	801,6	0.9%	189	840,5	0.9%
NATURAL GAS	332	25,902.3	28.4%	333	25,617.6	27.5%
FUEL OIL	11	305,9	0.3%	11	305,9	0.3%
SUN	6.901	5,995.2	6.6%	7.221	6,294.7	6.8%
IMPORTED COAL	15	8,966.9	9.8%	15	8,966.9	9.6%
GEOTHERMAL	54	1,514.7	1.7%	54	1,514.7	1.6%
LIGNITE	48	10,101.0	11.1%	47	10,097.3	10.9%
LNG	1	2.0	0.0%	1	2.0	0.0%
MOTORINE	1	1.0	0.0%	1	1.0	0.0%
NAPHTHA	1	4.7	0.0%	1	4.7	0.0%
WIND	275	7,591.2	8.3%	283	8,012.6	8.6%
STONE COAL	4	810.8	0.9%	4	810,8	0.9%
TOTAL	8.589	91,267.0	100.0%	8.934	93,022.7	100.0%

(https://www.teias.gov.tr/tr-TR/kurulu-guc-raporlari)

Table 60 - Profile of Hydroelectric Power Plants in Turkey as of 30 August 2020 (TEIAS, 2020)

Number of Power Plants	689
Installed Power	29,779 MW
Its Ratio to the Installed Power	32%
Annual Electricity Generation	~ 88.8 GWh (2019)
Ratio of Hydraulically Based Production to Total Consumption	29.3% (2019)
License Status	676 licenced 13 unlicenced

Table 61 - Amount of Water Drawn in Thermal Power Plants by Source, 2010 - 2018, (thousand m^3 / year)
(TURKSTAT, 2019)

Water source	Year	Total withdrawn water	Cooling water
Total	2014	6,536,015	6,397,092
	2016	8,611,221	8,467,951
	2018	7,872,230	7,352,042
Sea	2014	6,388,620	6,304,087
	2016	8,477,209	8,383,528
	2018	7,731,361	7,267,088
Dam	2014	66,515	36,679
	2016	57,749	35,850
	2018	69,248	35,493
Stream	2014	40,001	31,966
	2016	35,512	24,145
	2018	35,257	28,669
Well	2014	12,324	4,858
	2016	11,366	1,878
	2018	12,285	3,259
Other(1)	2014	28,554	19,503
	2016	29,385	22,550
	2018	24,079	17,533

The figures in the table may not add up due to rounding..

(1) It contains the waters drawn such as city network, spring, lake, pond, organized industrial zone network, from another workplace, etc.

C.4. Environmental Infrastructure

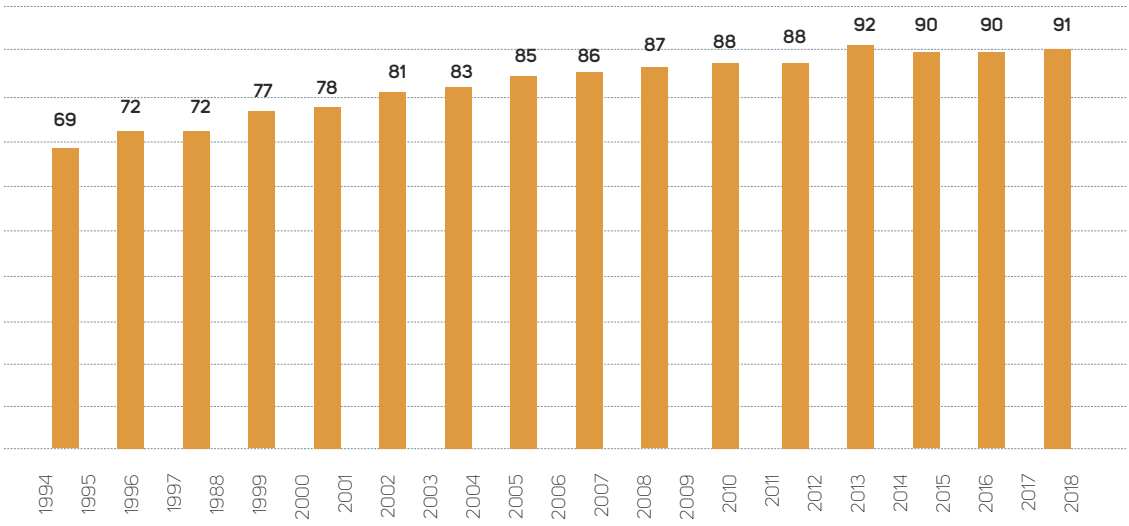
C.4.1. Urban Sewerage System and Beneficiary Population

Wastewater infrastructure systems consist of sewerage system and rainwater and wastewater treatment plants (WWTP). In recent years, sewerage networks have been built as separate systems in Turkey. However, some of the previously built sewerage networks are combined system and they are still in use. Sewerage network investments, which started in the 1970s, were carried out under the leadership of the General Directorate of Provincial Bank until the 1980s and reached a very high level in these years. In the 1990s; the investments continued, albeit at a low level. Initially, these investments were concentrated in large city centers, then expanded towards smaller residential areas. The new trend in water management is that the private sector has begun to play a role in the provision of infrastructure services as well as local governments. The establishment of water and sewerage administrations in metropolitan municipalities can be given as an example of indigenization in this field.

As a result of the efforts to protect the environment in our country and the financial and technical support provided by the Ministry of Environment and Urbanization, there has been a significant increase in the number of municipalities served by sewerage networks and wastewater treatment facilities and in the number of the population benefiting from these services.

While the ratio of the population served by sewerage to the municipal population was 69% in 1994, this rate reached 90% in 2014. Although the ratio was 92% in 2012, it decreased to 90% in 2014. This was mostly because there are the Municipalities that transformed into neighborhood / village status with the Municipality Law No. 6360. The ratio of the population served by sewerage to the municipal population reached 91% in 2018 (Graph 26) .

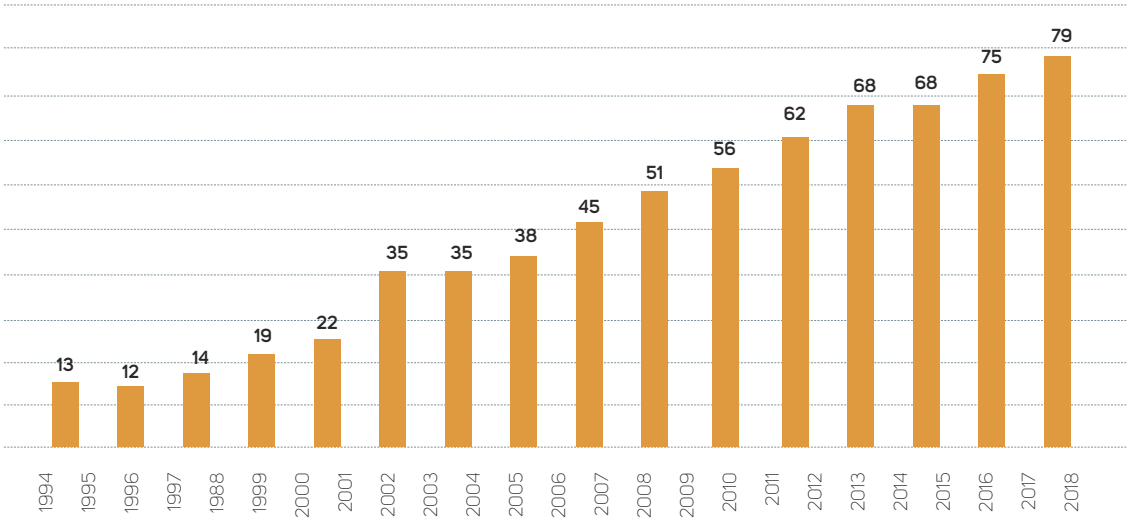
Graph 26 - Ratio of the Population Served by the Sewerage Network to the Total Municipality Population (%)
(TURKSTAT, 2019)



C.4.2. Urban Wastewater Treatment Plants

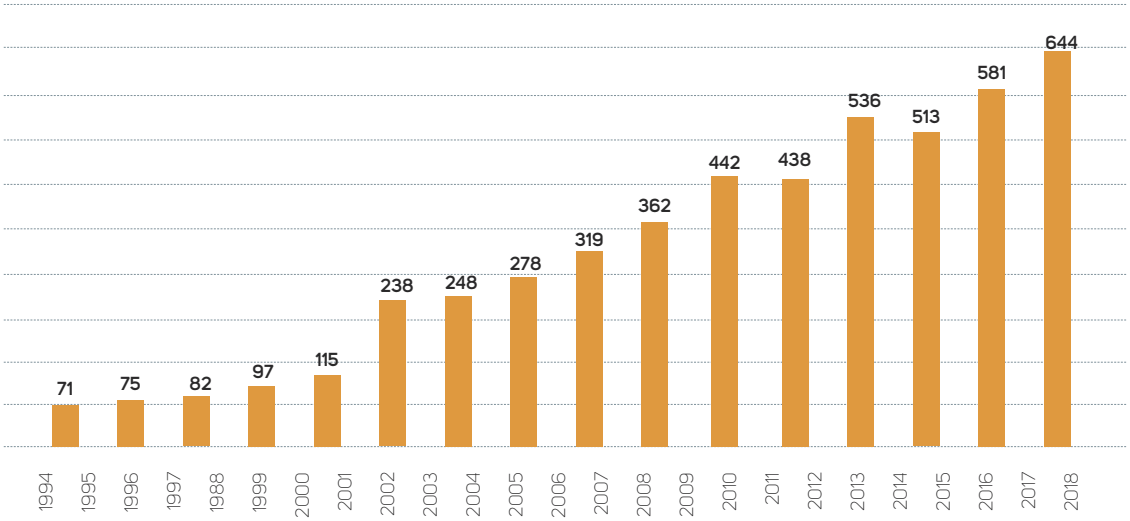
As can be seen in Graph 27, while 13% of the municipal population was provided with wastewater treatment services in 1994, this rate reached up to 68% at the end of 2014 and to 79% in 2018.

Graph 27 - The Ratio of the Municipal Population Served by the Wastewater Treatment Facility to the Total Municipality Population (%),
(TURKSTAT, 2019)



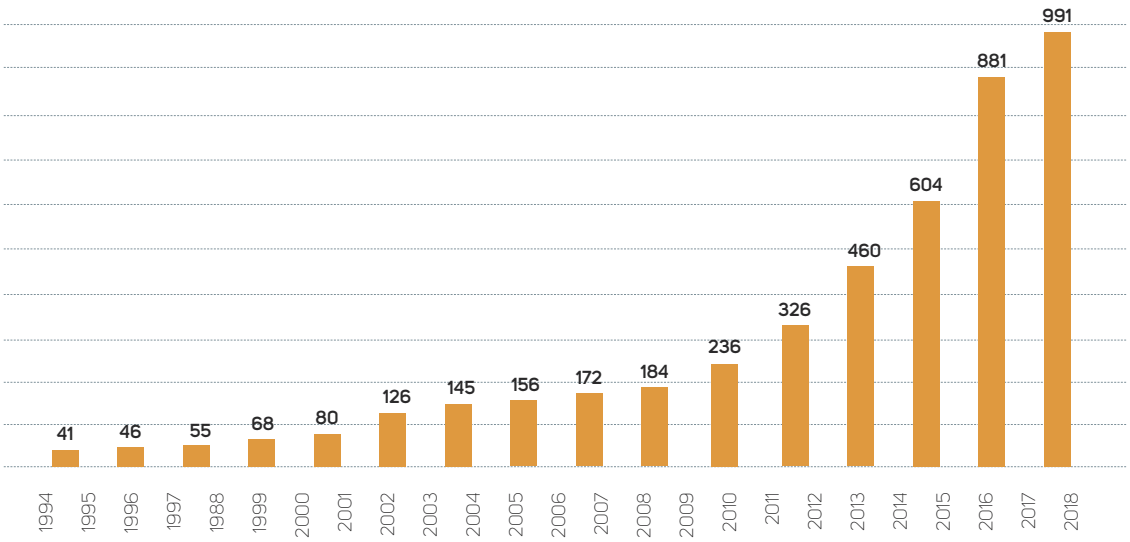
Map 12 - Wastewater Treatment Plant Status of Turkish City Centers
(Ministry of Environment and Urbanization, February 2020)

Graph 28 - Number of the Municipalities Providing Wastewater Treatment Plant Services (TURKSTAT, 2019)



* The data for 2014 is lower compared to 2012 since municipalities transformed into neighborhood / village status with the Municipal Law No. 6360.

Graph 29 - Number of the Wastewater Treatment Plants of Municipalities (TURKSTAT, 2019)



Up to fifty percent of the energy costs of the wastewater treatment plants operated in accordance with the legislation can be met within the scope of the By-Law. The number of facilities that have received Reimbursement Certificate to benefit from the Electricity Incentive reached 773 as of the end of 2019. Within the scope of the By-Law, 22.8 million TL was paid to 172 plants in 2011, 26.6 million TL to 212 plants in 2012, 30.2 million TL to 207 plants in 2013, 30.4 million TL to 225 plants in 2014, 46.4 million TL to 294 plants in 2015 TL 59.5 million TL to 375 plants in 2016, 62.8 million TL to 463 facilities in 2017, 70.5 million TL to 525 plants in 2018 and 103.6 million TL to 567 plants in 2019.

Table 62 - Amount of Wastewater Discharged from Municipal Network to Recipient Environments According to Recipient Environments

(TURKSTAT, 2019)

	2014		2016		2018	
	Amount	**%**	**Amount**	**%**	**Amount**	**%**
Amount of wastewater discharged	4,296,851	100.0	4,499,145(r)	100.0	4,795,130	100.0
Treated	3,483,787	81.1	3,842,350	85.4(r)	4,236,419	88.3
Untreated	813,064	18.9	656,795(r)	14.6(r)	558,711	11.7
Into Sea	1,915,294	44.6	1,812,650	40.3(r)	1,949,475	40.7
Treated	1,759,461	91.9	1,724,792	95.2	1,883,205	96.6
Untreated	155,833	8.1	87,858	4.8	66,270	3.4
Into Lakes/Ponds	93,596	2.2	78,551	1.7(r)	67,935	1.4
Treated	47,893	51.2	53,262	67.8	53,363	78.6
Untreated	45,703	48.8	25,289	32.2	14,571	21.4
Into Streams	1,898,895	44.2	2,153,123	47.9(r)	2,248,589	46.9
Treated	1,409,633	74.2	1,728,000	80.3	1,911,078	85.0
Untreated	489,262	25.8	425,122	19.7	337,511	15.0
Into Dams	120,781	2.8	126,325	2.8(r)	148,735	3.1
Treated	61,843	51.2	76,660	60.7	104,292	70.1
Untreated	58,938	48.8	49,665	39.3	44,443	29.9
On lands	17,954	0.4	20,063	0.4(r)	19,052	0.4
Treated	8,367	46.6	14,036	70.0	13,173	69.1
Untreated	9,587	53.4	6,027	30.0	5,878	30.9
To the other receiving environments	250,332	5.8	308,434(r)	6.9(r)	361,346	7.5
Treated	196,649	78.6	245,601	79.6(r)	271,307	75.1
Untreated	53,683	21.4	62,833(r)	20.4(r)	90,038	24.9

Note: The amount of wastewater treated outside of municipal facilities is included.

The figures in the table may not add up due to rounding.

(r) Revised.

C.4.3. Wastewater Infrastructure Facilities for Organized Industrial Areas and Individual Industries

Solving the environmental problems arising from industrialization and ensuring the development of industrialization in a controlled manner can only be achieved by disciplining the industry. Organized industrial zones are industrial areas where many industrial organizations from different sectors operate together to discipline industrial development. Enabling the planned development of cities, gathering the problems of the industries on common ground, and producing common solutions are among the

aims of the Establishment. Organized industrial zones have important functions in terms of disciplining the industry, protecting the environment, and supporting the production of enterprises operating in accordance with environmental norms. The use of joint treatment facilities for preventing environmental pollution caused by industry is one of the most important advantages of organized industrial zones.

There are 312 incorporated organized industrial zones in our country. Production activities take place in 236 of 312 organized industrial zones. There has been no activity yet in 76 organized industrial zones. According to the results of the inventory study conducted by the Ministry of Environment and Urbanization, 104 of the 236 organized industrial zones in operation have wastewater treatment facilities, 58 of them have a connection to the municipal canal, and projects and construction works related to wastewater treatment facilities for 22 of them are still in progress. There are no wastewater treatment facilities in 74 organized industrial zones.

Table 63 - Wastewater Data of Manufacturing Industry (TURKSTAT, 2019)

	2010	2012	2014	2016	2018
Amount of discharged wastewater (thousand m^3)	1,256,195	1,539,818	1,931,282	1,900,356	2,431,855
Amount of discharged cooling water	883,651	1,197,421	1,572,229	1,507,292	1,965,507
Amount of discharged wastewater except cooling water	372,544	342,397	359,053	393,064	466,348
Total amount of treated and discharged wastewater (thousand m^3)	164,315	188,577	207,575	251,243	276,538
Amount of treated and discharged cooling water	9,804	11,055	9,697	31,434	21,961
Total amount of treated and discharged wastewater except cooling water	154,510	177,521	197,878	219,809	254,577
Amount of wastewater discharged by receiving bodies (thousand m^3)	1,256,195	1,539,818	1,931,282	1,900,356	2,431,855
Municipal sewerage	80,922	59,459	59,723	58,124	64,314
Sea	c	1,193,937	1,558,816	1,518,126	1,976,984
Stream	244,893	148,432	140,321	136,234	164,818
Septic Tank	5,446	2,539	2,126	2,347	3,467
OIZ Sewage	109,326	112,658	121,292	130,337	164,484
Other Receiving Bodies (1)	28,443	13,683	49,004	55,188	57,790
Number of wastewater treatment plants	1,825	2,075	2,096	2,361	2,827
Physical /Chemical	656	778	878	1,077	1,386
Biological	1,089	1,190	1,094	1,177	1,323
Advanced	80	107	124	107	118
Capacity of wastewater treatment plants (thousand m/year^3)	489,955	555,809	539,453	599,267	676,017
Physical /Chemical	103,387	159,582	157,153	196,759	223,503
Biological	335,505	334,402	318,508	344,537	368,568
Advanced	51,062	61,825	63,792	57,970	83,946
Amount of wastewater treated in wastewater treatment plants (thousand m/year^3)	244,497	239,647	24,4112	285,035	332,391
Physical /Chemical	54,677	57,797	66,865	100,146	108,422
Biological	170,061	151,291	149,822	158,653	182,678
Advanced	19,760	30,559	27,425	26,235	41,290

(1) Includes wastewater discharged to village sewerage, tax-free zone sewerage, wastewater treatment plants of cooperatives, State Hydraulic Works channels, dry stream bed, mining site, wastewater used for on-site or off-site irrigation, etc.

c Confidential data

Table 64 - Water, Wastewater and Waste Indicators of Organized Industrial Zones, 2010 - 2018
(TURKSTAT, 2019)

	2010	2012	2014	2016	2018
Number of OIZ in operation	134	181	196	217	223
Number of OIZs with their own water network	101	129	157	170	182
Number of OIZs benefiting from the municipality's water network	17	26	15	22	20
Number of OIZs without water network	16	26	24	25	21
The amount of water drawn to the OIZ water network (thousand m^3)	126,013	138,494	167,592	175,377	185,474
Well	55,222	60,868	76,218	84,627	83,297
Source	23,909	24,473	26,752	20,098	24,730
Municipial Water System	13,648	18,198	22,706	25,018	26,005
Dam, lake, pond and stream	33,236	34,955	41,915	45,635	51,442

The change in wastewater and treatment plant indicators of organized industrial zones over the years according to TURKSTAT data can be seen in Table 65 below.

Table 65 - Water, Wastewater and Waste Indicators of Organized Industrial Zones, 2010 - 2018
(TURKSTAT, 2019)

	2010	2012	2014	2016	2018
Number of OIZ in operation	134	181	196	217	223
Sewerage Network					
The number of OIZs with its own sewerage network	102	136	162	179	189
Number of OIZs benefiting from the municipality's sewerage network	17	21	12	10	13
Number of OIZs without sewerage network	15	24	22	28	21
Amount of wastewater discharged by the OIZsewerage network (thousand m^3)(1)	190,014	234,679	253,967	262,815	267,695
Treated	161,023	191,990	220,547	229,027	252,492
Untreated	28,991	42,690	33,420	33,788	15,203
Number of wastewater treatment plants	38	57	76	91	104
Chemical / Biological treatment	24	41	54	68	72
Advanced treatment	14	16	22	23	32
Wastewater treatment plant capacity (thousand m^3 / year)	297,055	318,772	368,748	383,927	412,156

(1) The fact that the wastewater discharged by the OIZs is more than the drawn water is due to the discharge of the wastewater of the workplaces that supply their water with their selves means to the OIZ sewage network.

The figures in the table may not add up due to rounding.

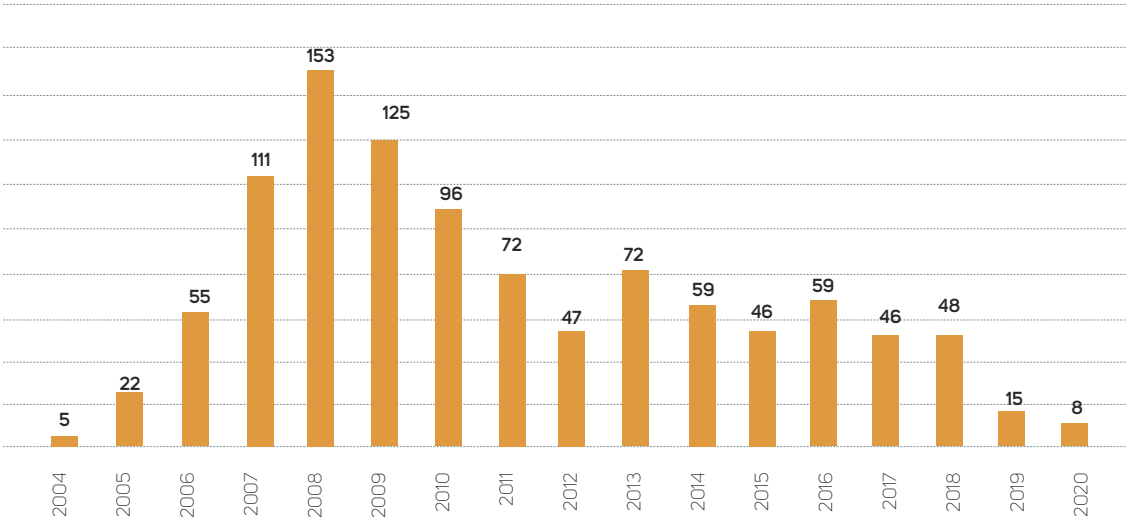
C.4.4. Wastewater Treatment Plant Project Approvals

The Ministry of Environment and Urbanization has carried out the WWTP Project Approval works and procedures to ensure the selection of wastewater treatment technologies that will provide the desired level of treatment efficiency and that have low investment and operating costs in the construction phase of wastewater treatment facilities (WWTP) since 2004.

Wastewater treatment plant project approvals are made within the scope of the "Wastewater Treatment / Deep-sea Discharge Facility Project Approval Circular" numbered 2018/14 and the approval process of a total of 4,397 Wastewater Treatment Plants Projects were completed between 2004-2020.

Graph 30 - Number of Facilities of Which Projects were Approved by the Ministry of Environment and Urbanization

(Ministry of Environment and Urbanization, 2020)



C.4.5. Wastewater Recovery and Reuse

When the wastewater recovery practices around the world are considered, it is seen that agricultural irrigation applications come to the fore in regions where the use of treated water is common and irrigation needs are high, especially in agricultural activities. On the other hand, the intensity of applications for urban use, groundwater feeding, environmental improvement, and human consumption is remarkable, as well. The most advantageous aspects of wastewater recovery practices are increasing drought resistance, reducing the use of natural water resources, and balancing the peak drinking-utility water demand, In general, centralized wastewater recovery practices are more common. However, there are also detached and on-site domestic wastewater recovery practices and gray water recovery practices.

The selection of the application method for wastewater recovery depends on many factors such as the intended use of the recycled water, the features of the application area, the landform, the state of the water resources, the socio-economic characteristics of the users. At the same time, the planning of local governments, wastewater recovery policies, and legal regulations are also important.

When the reuse of treated wastewater in the world and our country are generally evaluated,

- 7 billion m^3 / year treated wastewater was reused in the world and its ratio to total water usage is 0.59% according to 2011 data. It is predicted that 26 billion m^3 / year treated wastewater will be reused in the world in 2030, and the ratio of this rate to total water usage will be 1.66%. Recycled wastewater in the world is re-evaluated as 32% for agricultural irrigation, 20% for landscaping, and 19% for industrial use.

- Awareness has been created in our country regarding the treatment and reuse of wastewater in recent years. 1.7% of the total amount of treated wastewater is reused today.

One of the most important indicators of living in a healthy environment is the proper collection and disposal of wastewater. The smell of wastewater reduces the living standards and welfare of the inhabitants in the environment. Necessary care and attention should be paid to the wastewater collecting system (sewage) and its treatment.

Urban wastewater is a serious potential for Turkey. The recycling and reuse of water originating from holiday villages, large business centers, and similar enterprises are identified as essential to protect water bodies and prevent pollution within the scope of the revision studies of the By-Law on Water Pollution Control as well as encouraging the use of treated wastewater in agriculture and industry.

Although there are 26 urban WWTPs with wastewater recovery and reuse practices currently in our country, the size of our reuse potential will be seen more clearly when our developing wastewater infrastructure and the increasing number of treatment plants throughout the country are considered.

The Ministry of Environment and Urbanization aims to reuse 5% of wastewater by applying appropriate treatment technologies until 2023. To achieve this goal; the Ministry of Environment and Urbanization carried out the Reuse of Treated Wastewater Project between 2017-2018 to propose technical and administrative criteria on establishing the legal framework required for all kinds of reuse of wastewater specific to our country by investigating national and international practices and standards for the reuse of the urban and industrial treated wastewater within the framework of determining treatment technologies, water quality criteria, monitoring, and storage quality criteria.

The industrial sector application guidelines were created for six different sectors: mining, food, beverage, cellulose-paper-cardboard, coal preparation-processing-energy generation, and organized industrial zones as a result of the project.

On the other hand, action plan no.697 2 under the title of Urban Infrastructure of the 11th Development Plan covering the years (2019-2023) include "The reuse of treated wastewater safely for beneficial purposes, primarily in agriculture will be planned at the river basin level, thus reducing pressures on water resources" and it is aimed to expand the recovery and reuse of wastewater with basin-based activities in the upcoming period.

The Ministry of Agriculture and Forestry carried out a Project on the "Evaluation of Wastewater Treatment Alternatives for Different Water Reuse" between 2017-2019. It is aimed with this project to examine and evaluate alternatives for the reuse of urban wastewater and water returning from agricultural irrigation in Turkey.

598 wastewater treatment plants with a capacity of 2,000 m^3 / day and above were identified in Turkey as a result of the evaluations. 3 small capacity facilities, apart from these facilities, were added to the project inventory and a total of 601 wastewater treatment plants were evaluated. It was determined that the basin with the most wastewater treatment facilities in Turkey is the Fırat - Dicle Basin, and the highest wastewater treatment capacity is found in the Marmara Basin. The study has revealed that the wastewater treatment plants, evaluated within the scope of the project throughout Turkey, have a wastewater treatment capacity of 7.2 billion m^3 per year. While the annual amount of water to be reused is determined as 5.6 billion m^3, it is primarily recommended to reuse 3.4 billion m^3 of water per year.

328 irrigation facilities over 1,000 hectares operated or transferred by SHW in Turkey were examined under a study conducted on agricultural runoff. The agricultural runoff is mostly found in Fırat- Dicle Basin

which has the most irrigation facilities. Other basins with the highest irrigation potential throughout Turkey are determined as Seyhan, Büyük Menderes, and Ceyhan Basins. In all of these basins, a potential of over 250 million m^3 of agricultural runoff was found annually. It has been determined that the water potential of total agriculture is 3.2 billion m^3 annually. It has proposed that 2.3 billion m^3 of this should be reused annually.

TAGEM completed the Project on "Determination of Thrace region (Turkey's side) Water Resources Quality and Agricultural Aspects of Usability". It is expected that the project outputs will determine the irrigation water quality parameters and contribute to the prevention of agricultural pollution. Thematic mapping was also completed in 2019.

The Project on Determination of Water Quality of Eşen Streamlet in the Western Mediterranean Basin and its Evaluation in terms of Agricultural Irrigation carried out as a sub-project within the scope of the Project on "Determination of Irrigation Water Requirement and the Establishment of Strategic / Political Decision Support Tools" (BAKAROL). The project, it is aimed to determine the pollution status of Eşen Streamlet together with some water quality parameters and to evaluate it in terms of agricultural irrigation.

C.4.6. Wastewater Treatment Action Plan

The current Wastewater Treatment Action Plan, prepared to cover the years 2008-2012, has been updated. In this context; the Wastewater Treatment Action Plan (WTAP) has been prepared to evaluate the current realization status of the targets and strategies, legislation, wastewater infrastructure services, and investments foreseen in the WTAP for the period 2008-2013 and to update them so as to include the period 2014-2023.

With the WTAP, the current status of urban wastewater infrastructure investments of all municipalities across the country, the distribution of the investment expenditures, including the new and renewal investments for urban wastewater infrastructure facilities (wastewater treatment facilities and network investments) made between 2008-2013, according to financing sources (central government, local government, public-private cooperation, bilateral cooperation, EU credits, and other grant sources, etc.), and wastewater infrastructures of all organized industrial zones, free zones, and industrial areas were determined.

With the Action Plan in question, both the prioritization made by the Ministry of Environment and Urbanization was mentioned, and the WWTPs that should be done to achieve the goals in the Strategic Plan of the Ministry of Environment and Urbanization were prioritized.

On the other hand, "Sensitive Areas" in our country were determined within the scope of the Project of Determination of Sensitive Areas and Water Quality Objectives on Watershed Basis in Turkey, carried out by the Abolished Ministry of Forestry and Water Affairs and the "By-Law on Determination of Sensitive Water bodies and Areas Affecting These Water Bodies and Improvement of Water Quality", entered into force after being published Official Gazette No. 29927 dated 23.12.2016, was published.

In accordance with the provision of "Action plans containing measures to be implemented in urban sensitive areas are prepared and published jointly with the Ministry of Forestry and Water Affairs and the Ministry of Environment and Urbanization within 6 months after the publication of this By-Law" partaking in the second paragraph of Article 10 of the said By-Law, 2015-2023 Wastewater Treatment Action Plan has been updated by taking into account the urban sensitive areas determined by this By-Law (WTAP 2017-2023).

A total of 1,422 Wastewater Treatment Plants (1,326 new WWTPs and 96 WWTPs to be renewed) are projected to be established between 2017 and 2023 under the WTAP.

Furthermore, the financing need of WWTPs to cover the costs that will arise during both the investment and operation period with the first investment and renewal of the sewage system has been determined as 27,809,112,550 TL for the years 2017-2023.

C.4.7. Project on Determination of the Current Status of Domestic/Urban Wastewater Treatment Plants and Determining the Need for Revision (TURAAT)

Under the project, the current conditions of all domestic/urban wastewater treatment plants in 81 provinces across the country have been determined and the wastewater treatment facilities that are idle, not completed, and cannot be operated for various reasons, and the feasibility of the investments and costs required for the operation of these facilities in accordance with the relevant legislation has been prepared.

C.4.8. Project on Investigation of the Operability of Wastewater Treatment Plants with the Public and Private Sector Cooperation by Using Sample Feasibility(KÖİF) (2019-2020)

The project was prepared by investigating the operability of urban wastewater treatment facilities through feasibility studies by making public-private partnership (PPP) financial model and by preparing the administrative, legal, and technical specifications, and the draft implementation agreement, which are necessary for the tender to be made in partnership with the public and private sector. The Project was carried into effect to set an example for similar facilities. Within the scope of the Project; the necessary technical and administrative tender documents and a Draft Law as an additional article to Law No. 3996 Concerning the Realization of Certain Investments and Services in the Build-Operate-Transfer Model was prepared for the construction and operation of wastewater treatment facilities for real municipalities in 2 different population ranges (Kocaeli province Gölcük and Nevşehir province Ürgüp districts), for the revision/capacity increase and operation of an existing wastewater treatment plant for real municipalities of 2 different populations (rehabilitation in Kırıkkale Central district, rehabilitation/capacity increase in Simav district of Kutahya) and for the implementation of pilot feasibility and PPP finance model by investigating the feasibility of public and private sector partnership.

C.4.9. Researching Training and Certificate Programs for Technical Personnel Working in Wastewater Treatment Plants and Developing a Model Specific to Turkey (AATSER) (2019-2020)

The Ministry of Environment and Urbanization carried out the Project on Researching Training and Certificate Programs for Technical Personnel Working in Wastewater Treatment Plants and Developing a Model Specific to Turkey (AATSER) between 2019-2020 to develop a wastewater treatment technical staff training and certification system specific to our country by researching the examples of urban / industrial wastewater treatment plant technical staff training programs, certification and examination processes in the world, and the documents and visuals to be used in the training to be given within the scope of the Communiqué on Technical Personnel Working in Wastewater Treatment Plants.

The Ministry of Environment and Urbanization develops a software to enable the training and certificate program to be provided with the project outputs function properly, to make and follow-up exam applications. Approximately 8,900 people applied for the pre-application announcement for the said training, and processes such as exam applications, online training, and certification processes are planned to be started in the last quarter of 2020.

C.5. River Basin Protection Action Plans

The Ministry of Environment and Urbanization carries out studies on wastewater management to protect water resources at the basin level and improve water quality. Within this framework; a prioritization study was carried out in 25 basins across the country, taking into account the water quality in the basin, population density, protected areas, and initial investment costs. Gediz, Büyük Menderes, Seyhan, Ceyhan, Western Mediterranean, North Aegean, Eastern Mediterranean, Küçük Menderes Basins were determined as priority basins as a result of the study. Basin Pollution Prevention Action Plans have been prepared for the prevention of environmental pollution in 8 priority basins, and the plans to be made and the measures to be taken by all relevant institutions and organizations have been determined within the framework of the said plans and the objectives envisaged to be achieved in the short, medium and long term.

Forward-looking projections were made by determining the current water resources and water qualities in the basin, provincial and basin water quality were evaluated, threats and opportunities were assessed by considering the different sectors and resource users together, and short, medium, and long-term program of measures were built for enhancing the water quality within the scope of the Action Plans.

Making the necessary planning, maintaining the necessary personnel and equipment infrastructure, choosing new technologies, innovative approaches, and obtaining environmental permits, to enable the completion of waste disposal facilities, wastewater infrastructure works in a short time by the relevant municipalities, OIZ administrations, and industrial facilities will make a significant contribution to reaching the determined target.

It is aimed that the water quality in the basins will reach to 2nd Class at the end of 2023 owing to the short, medium and long term measures to be taken in Gediz, Büyük Menderes, Seyhan, Ceyhan, Western Mediterranean, North Aegean, Eastern Mediterranean, Küçük Menderes Basins. In this context, efforts to put the actions included in the Pollution Prevention Action Plans into action on the specified dates are still in progress.

C.5.1. Domestic and Industrial Pollution Monitoring Programme in Basins

Within the scope of basin monitoring; the Ministry of Environment and Urbanization conducts periodic monitoring studies in Ergene, Küçük Menderes, Gediz, North Aegean, Sakarya, and Susurluk Basins with the Domestic and Industrial Pollution Monitoring Programme (DIPMP).

It is aimed with the program to determine the hot spots in basins under the pressure of intense domestic and industrial pollutants by monitoring water in the receiving body and providing data for taking necessary measures to prevent pollution in the basin. Periodic samples are taken from the basins under DIPMP and their analyzes are carried out in the mobile water and wastewater laboratory and the Environmental Reference Laboratory (ERL).

Conducting the said monitoring program (DIPMP) regularly every year, monitoring the pollution, effective implementation of the action plans to be prepared with the data produced by the program will contribute positively to the protection of our water resources and human and environmental health.

The program was developed in 2017-2019 as a result of the findings obtained from regular monitoring studies, and monitoring studies were carried out in hot spots, facilities near the hot spots, and in all facilities with Continuous Wastewater Monitoring System (CWWM) in the basin. The treatment index of these facilities was determined and the base was established for the treatment scorecards. Kahramanmaraş Aksu Streamlet was added to the existing basins in 2018.

The relevant departments of the Ministry of Environment and Urbanization benefit from the data of the DIPMP when directing basin-based limits, especially in basin action plans or projects and legislation studies on the prevention of pollution. Efforts of 2020 have started and the DIPMP proceeds by being developed.

C.6. Water Management Plans

C.6.1. River Basin Management Plans

It is extremely important to carry out planning studies to protect and use water resources sustainably and leave clean and sufficient water resources to future generations.

The Ministry of Agriculture and Forestry has been preparing the River Basin Management Plans, in line with the European Union Water Framework Directive, since 2014 to provide a holistic and sustainable use of water resources in terms of quality and quantity and to meet the closing criteria of the European Union Environment Chapter.

The procedures and principles regarding the preparation, implementation, and follow-up of River Basin Management Plans are regulated under the By Law on the Preparation, Implementation, and Follow-Up of River Basin Management Plans published in the Official Gazette No. 28444, dated 17.10.2012. According to the said By-Law; after the River Basin Management Plans are prepared, they are approved by the Water Management Coordination Board and enter into force. High-level coordination and cooperation are ensured by the Water Management Coordination Board, formed by high-level representatives of stakeholder public institutions, for the discussion and approval of River Basin Management Plans and ensuring the implementation of the plans by stakeholder institutions. The task of monitoring the implementation of the plans has been assigned to the Provincial Water Management Coordination Boards in the provinces and the Basin Management Committees in the basin within the scope of the By-Law on the Preparation, Implementation, and Follow-up of River Basin Management Plans.

Within the scope of the Communiqué on the Establishment, Duties, Working Procedures and Principles of Basin Management Central Board, Basin Management Committees and Provincial Water Management Coordination Boards published in the Official Gazette No. 30659, dated 18.01.2019; ensuring the follow-up of the measures locally by these structures already established makes a significant contribution to the implementation of the measures.

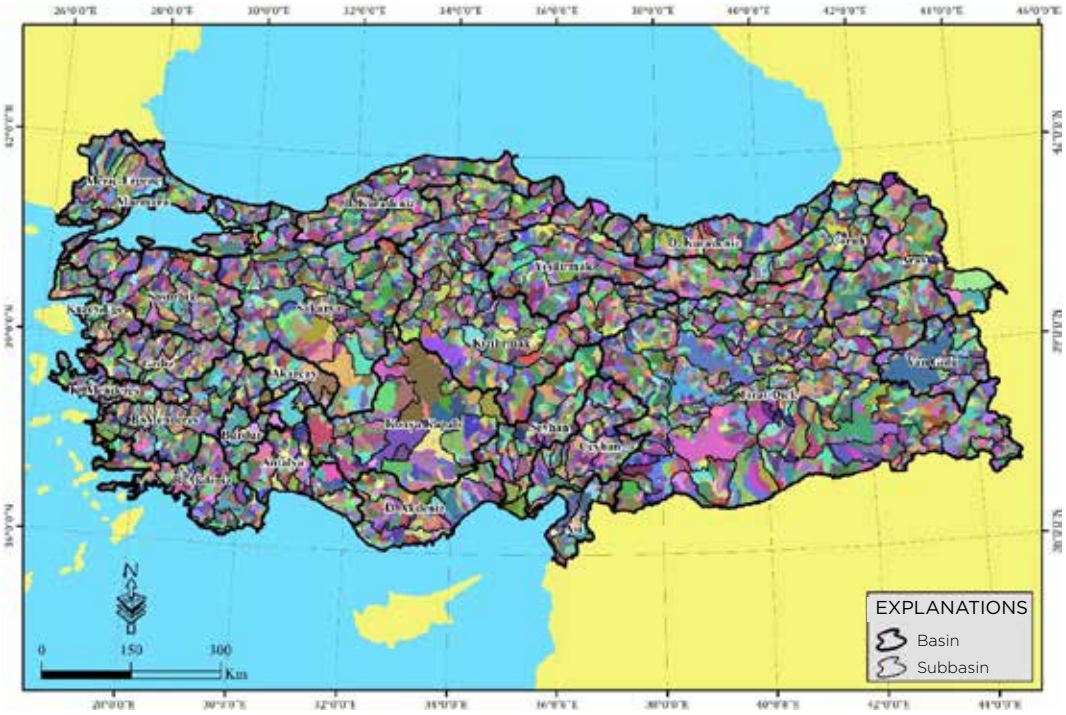
River Basin Management Plans have already been prepared in 8 of the 25 river basins in our country and planning studies regarding 3 basins are in progress. River Basin Management Plans, which are aimed to be completed for all basins by 2023, will be updated every 6 years.

C.6.1.1. Digitization of Water Resources

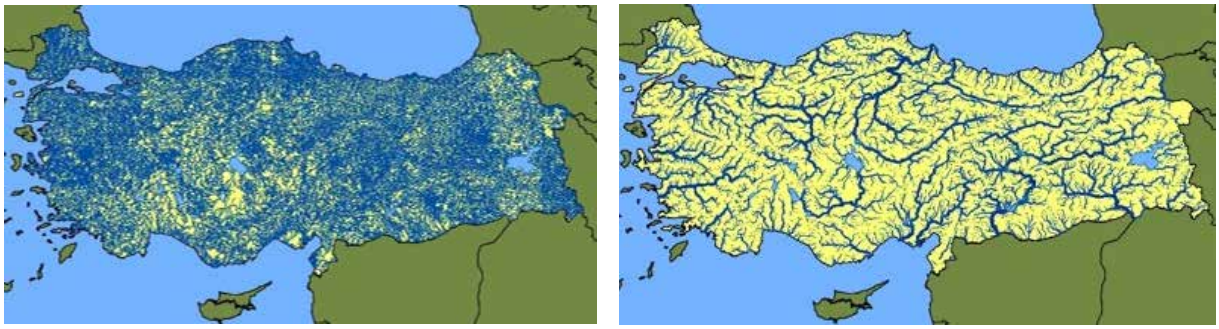
The most fundamental step in achieving sustainable water management is generating accurate and up-to-date water resource data. the Ministry of Agriculture and Forestry has delicately standardized all data considered to be related to surface water resources and water resources and digitized them so as to be appropriate for analysis not only to serve this purpose in our country but also to produce accurate and up-to-date water resource data to be used in the studies of all other institutions / organizations.

River layer, broad river layer, lake / dam / pond layer, channel layer, facility layer, basin layer, sub-basin layer, drainage area layer, river-crossing waterbody layer, lake waterbody layer, typology boundaries layer, and hydrological ecoregion layer have been formed, according to the basic needs in water management, to be used in all environmental studies of our country through the orthophoto service provided by the General Directorate of Mapping.

Map 13 - Map of Drainage Areas
(Ministry of Agriculture and Forestry, Hydrological Analysis Document, 2020)



Map 14 - Water Resources Base and Waterbody Base
(Ministry of Agriculture and Forestry, Digitization Procedures and Principles Document, 2020)



C.6.2. Basin Protection Action Plans

The Basin Protection Action Plans have been prepared in 25 river basins with a holistic basin management approach and started to be implemented as of 2014. The measures to be implemented in the short, medium, and long term have been planned, programmed, and prioritized within the framework of 15 action titles during the preparation of the Basin Protection Action Plans.

"The Communiqué on the Establishment, Duties, Working Procedures and Principles of the Basin Management Central Board, Basin Management Committees and Provincial Water Management

Coordination Boards" was prepared to implement effectively the basin-scale plans prepared for the protection and improvement of water resources and o ensure stakeholder participation and entered into force after being published in the Official Gazette No. 30659, dated 18 January 2019. 26 Basin Management Committees in 25 basins, Provincial Water Management Coordination Boards in 81 provinces, and Basin Management Central Boards in Ankara have been established in accordance with the Communiqué and the implementation of the measures determined by basin-scale plans are monitored by means of these committees and boards. Furthermore, high-level monitoring and policy determination processes are carried out through the Water Management Coordination Board established by the Prime Ministry Circular No. 2012/7 published in the Official Gazette no. 28239, dated 20 March 2012.

C.6.2.1. Water Quality Action Plans

C.6.2.1.1. Nilüfer Stream Sub-Basin Water Quality Action Plan

Nilüfer Stream Sub-Basin Water Quality Action Plan was put into effect in 2014, within the scope of improving the quality of Nilüfer Stream located in Bursa. In the said action plan, factors affecting water quality were addressed holistically and 15 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.2.1.2. Action Plan for Water Quality Improvement in Sacır Brook and Nizip Stream

"Action Plan for Sacır Brook and Nizip Stream" was prepared under the coordination of the Ministry of Agriculture and Forestry to eliminate the water quality problems in Sacır Brook and Nizip Stream located within the borders of Gaziantep Province. Circular No. 2015/2 on the "Action Plan for Water Quality Improvement of Sacır Brook and Nizip Stream" was signed and entered into force on 20.10.2015 to ensure that it is applied with precision and discipline by responsible institutions and organizations.

18 actions for Nizip Stream and 10 actions for Sacır Brook were determined by taking into account the pollution pressure and possible effects in the basin within the scope of the Action Plan.

C.6.2.1.3. Boğazköy Dam Lake Sub-Basin Water Quality Action Plan

Boğazköy Dam Lake Sub-Basin Water Quality Action Plan was prepared to reach the irrigation water level in the dam by improving the water quality of the Boğazköy Dam Lake built to irrigate the Yenişehir Plain within the boundaries of the province of Bursa, and the water sources feeding the dam and put into effect in September 2014. In the said action plan, factors affecting water quality were addressed holistically and 7 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.2.1.4. Ilgın (Çavuşçu) Lake Sub-Basin Water Quality Action Plan

The Action Plan was prepared for controlling and eliminating the water quality problems in Ilgın Çavuşçu Lake, which is located in the north of Ilgın District of Konya province, and which was transformed into storage with the earth embankments built in the north and south in 1963-1969. The Action Plan was put into effect in April 2015. In the said action plan, factors affecting water quality were addressed holistically and 7 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.2.1.5. Mogan-Eymir Lake Sub-Basin Protection Action Plan

Mogan and Eymir Lakes are Specially Protected Environment Areas and located in the Ankara Stream Sub-Basin. The duties and responsibilities of various institutions and organizations were determined under the Action Plan prepared for the purpose of determining and implementing the necessary measures to control and eliminate the water quality problems that occur in these lakes, and the plan was put into effect in 2014.

8 actions were determined considering the pollution pressure and possible effects in the basin within the scope of the Action Plan.

C.6.2.1.6. Manyas Lake Sub-Basin Water Quality Action Plan

The "Manyas Lake Sub-Basin Water Quality Action Plan" was prepared to protect the Manyas Lake against all kinds of effects that could disrupt the ecological structure and to improve the water quality, and put into effect by being published in the annex of the Ministry Circular No. 2016/3, dated 14.06.2016.

In the said action plan, factors affecting water quality were addressed holistically and 10 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.2.1.7. Uluabat Lake Sub-Basin Water Quality Action

Uluabat Lake is one of the richest lakes in our country in terms of aquatic plants, fish, and bird populations, and the Uluabat Lake Sub-Basin Water Quality Action Plan was prepared to maintain its ecological importance and improve its water quality and it was put into effect after being published in the annex of the Ministry Circular No. 2016/3, dated 14.06.2016.

In the said action plan, factors affecting water quality were addressed holistically and 9 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.2.1.8. Burdur Lake Sub-Basin Action Plan

Burdur Lake Sub-Basin was examined in detail to prevent the withdrawal of water in Burdur Lake and to protect the water quality of the basin against pollution risks and the water resources, structures, treatment, discharges, and land use of the basin were ascertained. As a result, the actions foreseen and planned for improving the water quality and quantity in the basin, and protecting/ improving the environment, were determined. In this respect, Burdur Lake Sub-Basin Action Plan was prepared to preserve and improve the water quality and quantity of the lake holistically and sustainably, by considering the protection-use balance.

"Burdur Lake Sub-Basin Action Plan Circular" No. 2015/4 was signed on 13.11.2015 and entered into force under the coordination of the Ministry of Agriculture and Forestry of the Action Plan to ensure the responsible institutions and organizations implement the said Action Plan in a sensitive and disciplined manner. Within the scope of the Action Plan prepared; the pressures and impacts on the lake and the general condition of the basin were assessed, and the measures identified for the basin and the necessary actions were collected under 9 main headings.

C.6.2.1.9. Gölbaşı, Azaplı, and İnekli Lakes Water Quality Action

"Gölbaşı, Azaplı, and İnekli Lakes Water Quality Action Plan" was prepared to take the necessary measures for controlling and eliminating the water quality problems in Gölbaşı, Azaplı, and İnekli Lakes located within the borders of Gölbaşı District of Adıyaman Province. The Action Plan was put into effect in December 2019. In the action plan in question, factors affecting water quality were handled holistically and 5 actions to be carried out in coordination with relevant institutions and organizations were determined. In the said action plan, factors affecting water quality were addressed holistically and 5 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.2.1.10. Işıklı Lake Water Quality Action Plan

Işıklı Lake Water Quality Action Plan was prepared to take the necessary measures for controlling and eliminating the water quality problems in Işıklı Lake located within the borders of Çivril district of Denizli Province. The Action Plan was put into effect in December 2019. In the said action plan, factors affecting water quality were addressed holistically and 6 actions to be carried out in coordination with relevant institutions and organizations were determined.

C.6.3. Control of Water Loss and Leakages

The rate of water loss in drinking and utility water networks in our country is approximately 37% according to the available data. The water loss in the network, after being taken from the source and treated to a large extent, and not reaching the intended end-use due to various reasons both increases the unnecessary pressure on water resources and causes an increase in the water costs at the same rate.

Efforts are carried out in the field of monitoring, control, and prevention of water losses in our country. In this context, the "By Law on Control of Water Losses in Drinking-Water Supply and Distribution Systems" (Official Gazette No. 28894, dated 8/5/2014, Amendment Official Gazette No. 30874, dated 31/8/2019) and "Communiqué on Technical Procedures" (Official Gazette No. 29418, dated 16/7/2015) were published to detail the principles set out in the By-Law, and to guide the water administrations and the municipalities.

The duties and responsibilities of water administrations regarding reducing water losses in water supply, transmission, distribution, and consumption were determined with the entry into force of the said legislation. In accordance with the relevant legislation; the metropolitan and provincial municipalities are obliged to reduce their water losses to a maximum of 30% by 2023 and a maximum of 25% by 2028; other municipalities are obliged to reduce their water losses to a maximum of 35% by 2023, a maximum of 30% by 2028, and a maximum of 25% by 2033.

Within the scope of the By-Law, issues regarding infrastructure investments and focusing on control and monitoring systems are regulated to reduce the current water loss in our country to acceptable levels. In this context, principles on the management of drinking water supply and distribution systems such as ensuring continuous monitoring and control of the continuous flow and volume measurement devices by digitizing the network, and establishing the necessary technological infrastructure in this direction, repairing and renovation works following the technique and creating the necessary technical capacity for this have been determined and an annual reporting provision has been introduced to create an inventory for tracking water losses. Our municipalities, which are responsible for the management of water networks in our country, have important responsibilities within the scope of efforts to combat water losses.

The amount of water, to be gained by reducing the water losses to the level of 25%, was calculated by using the unit water prices obtained from the accrual tables of the municipalities and the economic equivalent of the water calculated is approximately 2.5 billion TL.

There are also significant water losses in the irrigation systems, as well as losses in the Drinking-Water networks, in our country. The irrigation efficiency is at the level of 48% according to the 2018 data. By Law on Water Audit and Water Losses Control in Irrigation Systems was entered into force by being published in the Official Gazette No. 29981 on February 16, 2017

The purpose of the by-law is to regulate the "principles and procedures regarding supplying, distribution of the irrigation water and reducing the usage costs by means of the efficient use of irrigation water in irrigation systems, water savings, reduction of water losses and prevention of unauthorized use". The provision of " the necessary measures shall be taken to increase the irrigation efficiency to 55% within seven years from the effective date of the by-law" was enacted under the by-law.

The efforts were carried out regarding the efficient use of water and reduction of water losses in the drinking-potable water sector, industrial sector, and agriculture sector in Akarçay, West Mediterranean, and Yeşilırmak basins under the Technical Assistance on Economic Analyses within River Basin Management Plans and Water Efficiency Aspects in 3 Pilot River Basins conducted between 2017-2020. The following documents were prepared in this regard in the project:

- The Current Situation Report and Action Plan regarding Drinking-Potable Water Supply and Wastewater Management Efficiency and Pricing

- The Current Situation Report and Action Plan regarding Industrial Water Management Efficiency and Pricing
- The Current Situation Report and Action Plan regarding Agricultural Water Management Efficiency and Pricing
- Methodological Guidelines for Pricing the Drinking-Water Supply and Wastewater Management
- Feasibility Studies on Water Efficiency in Three Pilot Areas: Drinking-Potable Water Sector Pilot Area, Industrial Sector Pilot Area, and Agriculture Sector Pilot Area
- Methodological Guidance on Water Use Efficiency

C.6.4. Sectoral Water Allocation Plan

The increasing need and demand for water resources and the fact that this resource does not exist in the desired amount and quality according to time and location necessitate the most efficient use of existing water resources within the economic, environmental and social benefits. With the Sectoral Water Allocation Plans to be prepared in this context, it is aimed to ensure the sharing of water resources at the basin and sectoral sub-basin scale, to plan those for the future, and to meet the water needs of each sector in a fairway.

The duties and authorities of the General Directorate of Water Management specified in Article 421 of the Presidential Decree No. 1 published in the Official Gazette No. 30474, dated 10 July 2018 as "carrying out studies for the determination of policies regarding the protection, improvement, and use of water resources" under (a) clause and "making the necessary coordination regarding the allocation of water resources on the sectoral basis in accordance with river basin management plans" under (ı) clause, are entrusted to the General Directorate of Water Management.

In this context, the Ministry of Agriculture and Forestry prepares Sectoral Water Allocation Plans for the sustainable management of water at the basin scale, and to plan the use of the water that all sectors in the basin (environment, drinking, and use, agriculture, industry, energy, mining, fisheries, and aquaculture, etc.) will need for their future activities. Action plans are prepared to implement the measures determined in the said plans in response to the drought prediction and to monitor the allocation amounts and they are monitored in coordination with the relevant institutions and organizations.

Efforts relevant to Sectoral Water Allocation Plans in our country started in 2015 and plans were completed in 5 basins (Seyhan, Akarçay, Konya, Gediz and Küçük Menderes). It is aimed to be completed for all our basins by 2023.

Sectoral water allocation is essential in basin-based water management. In this context, studies regarding the water allocation projects were initiated in 3-4 basins. In these studies, how much income is earned when how much irrigation water is allocated to the agricultural sector (irrigation areas in the basin) in normal and dry years is determined by crop pattern optimization. Studies of determining the optimum plant pattern in agricultural areas are important for farmers to gain more income with less water compared to their current practices.

In this context, the " Determination of Water Quality of Eşen Stream in the Western Mediterranean Basin and its Evaluation in terms of Agricultural Irrigation", conducted by TAGEM, will constitute an important basis for such studies.

Plant Water Consumption Guide has been updated to set out the water yields of the basins and the basin water budget, identifying them at the level of sub-basins by taking into account the existing water potential and water consumption of plants as well as agricultural supports, climate, soil and topography and determining the plant water needs to be used in the planning, design and operation phases of irrigation projects

"Plant Water Consumption Guide of Plants Irrigated in Turkey" was published by calculating the Plant Water Consumption of 86 plants in the data of 255 meteorology stations. The "Irrigation Techniques Guide of Plants Irrigated in Turkey", prepared by compiling the research, irrigation engineers and turned into practical application, was distributed to relevant institutions and organizations in 2018. These guides in question were used in SHW applications and Water Allocation Projects of the General Directorate of Water Management (Seyhan, Akarçay, Konya and Küçük Menderes) and the River Basin Management.

C.6.5. Flood Management Plans

Preparation of flood management plans is an important effort that a country will do to ensure flood preparation and flood control. The purposes of flood management plans are to reduce the negative effects of the flood in our country by analyzing the problems that will increase the risk of floods and determining the precautions to be taken before, during, and after the flood to solve the flood problem before a crisis.

Flood management plans have started to be prepared in 25 basins to reduce the risk of flooding in our country. Flood management plans for 16 basins (Yeşilırmak, Western Mediterranean, Susurluk, North Aegean, Gediz, Küçük Menderes, Büyük Menderes, Antalya, Burdur, Akarçay, Western Black Sea, Sakarya, Kızılırmak, Eastern Mediterranean, Ceyhan, and Aras Basins) have already been prepared and it is planned to be completed in 25 basins by the end of 2021.

C.6.6. Drought Management Plans

An increase has been observed in drought events in the world and our country in recent years. Turkey is very sensitive to drought due to the characteristics of arid and semi-arid climatic conditions. In countries such as Turkey, where water-oriented activities continue intensively, the effects of droughts can spread over wide areas and affect directly and indirectly many sectors, especially agriculture. Prolonged drought events disrupt the hydrological balance between plant-soil-water and cause serious economic, environmental, and social effects.

The areas at risk of drought in the basin are determined with drought management plans and thus; they act as a guide to the institutions/organizations in the regions on what they should do in terms of providing drinking-water, agriculture, industry, and water supply to the ecosystem.

Drought management plans were prepared in 15 basins (North Aegean, Küçük Menderes, Western Mediterranean, Burdur, Akarçay, Antalya, Konya, Eastern Mediterranean, Lake Van, Büyük Menderes, Gediz, Seyhan, Ceyhan, Asi, and Fırat-Dicle) in our country. It is aimed to prepare a drought management plan for all basins in our country until the end of 2023.

The "Strategy and Action Plan for Combating Agricultural Drought in Turkey (2018-2022)" put into practice by the Ministry of Agriculture and Forestry on drought, as one of the most important indicators of climate change, aims to solve the problems that might occur due to drought in agriculture with the participation of all institutions, organizations and water users for jointly implementing the measures regarding the measures to be taken to reduce the effects of possible drought in our country.

The Action Plan comprises the Drought Risk Estimation and Crisis Management, Ensuring Sustainable Water Supply, Effective Management of Agricultural Water Demand, Supportive R&D Studies and Increasing Training / Extension Services and Improving Institutional Capacity.

C.6.7. Studies on Determining the Impact of Climate Change on Water Resources

Our country is located in the Mediterranean Basin where the effects of climate change will be relatively intense, and climate change is one of the current issues threatening the water resources in our country. How and in what way climate change will affect water resources should be evaluated specifically for water basins.

Project on the "Impact of Climate Change on Water Resources" was carried out to determine how climate change will affect the water potential in 25 basins until 2100,and to identify the basins and periods that are likely to cause budget deficits within the scope of the studies of determining the effects of climate change on water resources, which have been carried out in our country since 2011.

As a result of the said project, it was determined that snow-covered areas in the mountainside will be at risk as a result of high-temperature increases. For this reason, the effects of climate change on snow load and melting, and the changes that these melts would cause in river flows until the end of the 21th century the Upper Euphrates Basin (Keban Dam upstream), where approximately 70% of the total annual water potential consists of snow melts, were determined under the Project "Determining the Effect on Snow Melting and Flows".

The results of the studies indicate an increase of at least 3.5^{o}C in the average temperatures throughout Turkey. It is predicted that the total annual precipitation will vary regionally, decreases up to 350 mm will be experienced in the western and southern parts, however, an increase of around 200 mm may be experienced especially in the northeast of the country. Furthermore, it is predicted that the areas covered with snow in the Upper Euphrates Basin will decrease by 44%, the snow cover will accumulate later and melt earlier than usual and the expected flows during the melting period will decrease by 12-15%. When the water situation is evaluated based on basins, a serious water deficit is expected in the Fırat-Dicle and Konya Closed Basins. While it is estimated that water will generally be sufficient in Marmara, Susurluk, North Aegean, Western Mediterranean, Western Black Sea, Yeşilırmak, Antalya, Aras, and Van Lake Basins, excess water is expected in the Eastern Black Sea and Çoruh Basins.

The results of the studies conducted to determine the effects of climate change on water resources are shared on the website http://iklim.tarimorman.gov.tr.

C.7. Soil Pollution and Control

Soil is a natural mass formed by the decomposition and disintegration of the main material in various topographic conditions and within a certain time, under the influence of climate and living things, showing great vitality due to the important physical, chemical, and biological events occurring in it, and providing physical support and nutrition to the plants.

Soil is not only an economic resource but also one of the most important natural resources with its ecological elements such as climate, floras and fauna. The achievement of a balanced and permanent economic and social development is closely related to the determination and definition of these resources in the light of scientific data, taking into account the needs of the country.

C.7.1. Point Source Pollution Areas

The procedures and principles- regarding the detection, evaluation, cleaning, and monitoring of the pollution caused as a result of accidents that may occur during the collection, transportation, temporary and interim storage, recovery, reuse, and disposal of hazardous wastes, or as a result of accidents or

disasters that may occur during the storage and transportation of hazardous wastes and chemicals because of the violation of the legislation- were defined within the By Law on Control of Soil Pollution and Areas of Point Source Pollution that entered into force after being published in the Official Gazette N. 27605 dated 08 June 2010.

The By-Law is carried out over the "Polluted Sites Information System". The Contaminated Sites Information System enables the systematic maintenance, update, sustainability, and rapid access when necessary to the inventory information for the point source contaminated site. 38,067 activity owners entered the system. The mentioned information system can be accessed via http://ecbs.cevre.gov.tr address.

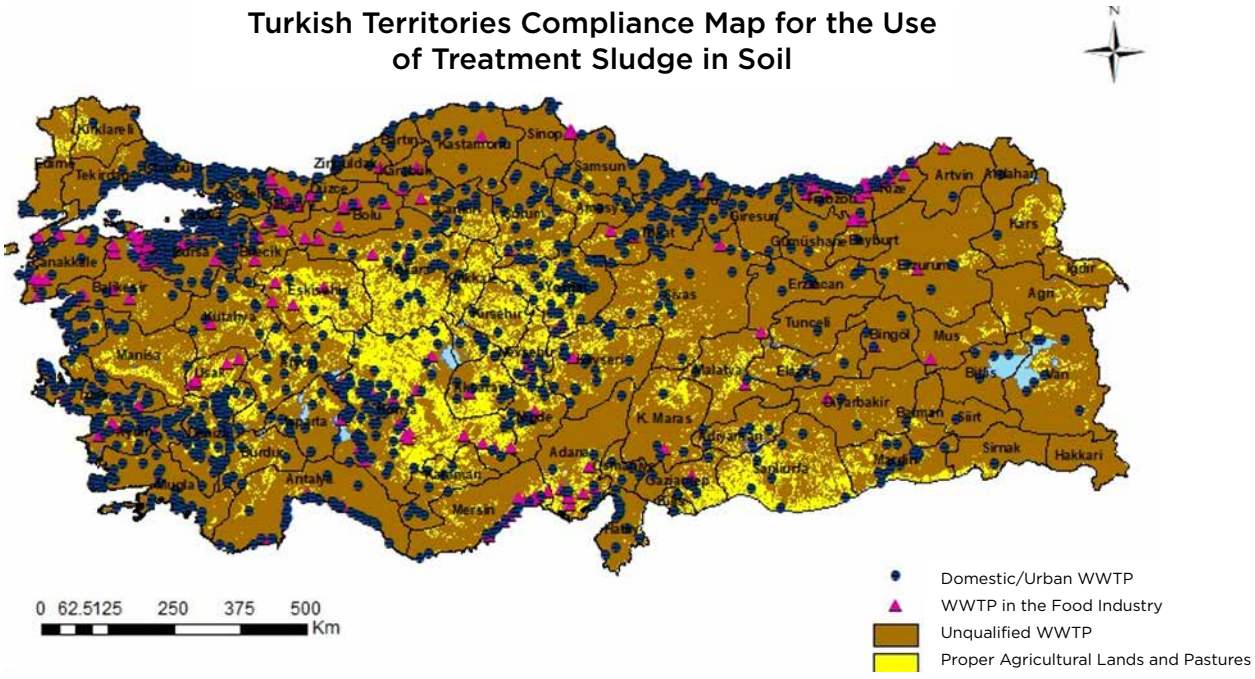
C.7.2. Use of Treatment Sludges in Soil

The By Law on the Use of Domestic and Urban Treatment Sludges in Soil was prepared to benefit from the soil improvement feature of the treatment sludge in our country, and to determine the technical and administrative principles for its controlled use in the soil in a way that does not harm the soil, plant, animal, and human, and entered into force after being published in the Official Gazette No. 27661, dated 03.08.2010.

Within the scope of the aforementioned by-law, 30,382 tons/year treatment sludge generated in different wastewater treatment plants between 2016 and 2019 was allowed to be used on a 4,815,5 decares land.

The potential areas where treatment sludge can be applied to the soil and the wastewater treatment facilities of the domestic / urban and food industry that may have the potential to be applied to the soil in Turkey, within the scope of the Project on Treatment Sludge Management and Action Plan Preparation in Turkey implemented by the Ministry of Environment and Urbanization between 2016-2019 to ensure effective and sustainable management of treatment sludge, are shown in Map 15.

Map 15 - Turkish Territories Compliance Map for the Use of Treatment Sludge in Soil (Ministry of Environment and Urbanization, 2020)



C.7.3. Studies on the Control and Prevention of Environmental Pollution from Agricultural Activity

Despite the increasing population and decreasing agricultural lands, the pressure on land and water resources is increasing as a result of the intensive use of inputs to meet the required amount of agricultural production. In this context, reducing and preventing pollution, ensuring sustainable development by ensuring the use of natural resources without damaging the ecological balance, and preventing environmental damages of agricultural activities at the source should be among the priorities in agricultural policies.

It is aimed to protect and ensure the sustainable use of the environment and natural resources by reducing the pollution of the plant nutrients in surface and ground waters caused by agricultural activities through the determination of the Nitrate Sensitive Areas that are contaminated due to agricultural activities or are under the threat of pollution, preparation of the action plans to prevent pollution from agricultural activities in water, adding the measures to be implemented within the action plans to the scope of supports and awareness-raising activities by the Ministry of Agriculture and Forestry.

The By Law on the Protection of Waters against Agricultural Nitrate Pollution, published in the Official Gazette No. 25377, dated 18.02.2004 by the Ministry of Agriculture and Forestry, within the scope of harmonization studies of the Nitrate Directive (91/676 / EEC) in the European Union harmonization process, entered into force after being published in the Official Gazette No. 29779, dated 23 July 2016. The basic provisions of the by-law are; determination of contaminated waters or those under the threat of contamination, determination of nitrate sensitive areas, preparation of Good Agricultural Practices Code, the establishment of Agricultural Action Plans in Sensitive Areas, and establishment of Monitoring Network and Reporting System.

TAGEM conducts a project on "Determination of Plant Nutrient and Potential Toxic Element Scopes of Turkish Agricultural Soils, Creation a Database and Mapping".

The project aims to; determine the fertility condition of farmlands in Turkey at the local, regiona,l and national level and their potential toxic element content, prepare maps for the distribution of lands according to their parametric features, and form a basis for a reliable-inquirable national soil database. Within this scope, 50.000 soil samples taken according to a 2,5 km x 2,5 grid system representing all farmlands in Turkey will be analyzed for fertility parameters (structure, water saturation, soil reaction, electrical conductivity, lime, organic matter, available phosphorus, total N, extractable K, Ca, Mg, Na, and B, available Fe, Cu, Zn, Mn Al, Pb, Cd, Cr, Cu, Ni, Co, and potentially toxic element content Cu, Zn, Ni, Cd, Cr, Fe, Mn, Mg, Ca, Na, K, P, Pb, and Co).

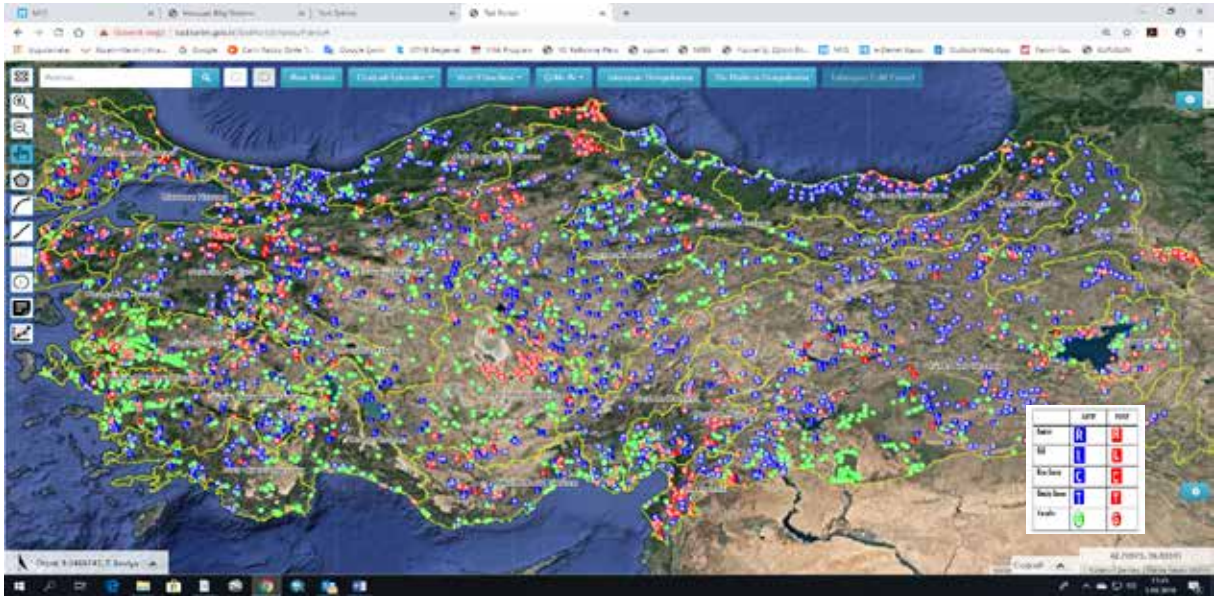
The database which will include information on fertility status of Turkey's lands and scope of macro and micro plant nutrients and potentially toxic element content, GIS supported national 1/100000 scale maps on distribution of soils according to their features, monitoring temporal changes in soil features and gaining software that enables entering new point data into the system are the most important outputs of this project. Additionally, environmental protection is supported through sewer pipe laying works within the scope of outsourced projects. In line with this process, sewerage works were carried out in 30 villages under Sivas Erzincan Development Project (SEDP) and sewerage service was provided for 10,878 residents. Also, 1,200 residents benefited from sewerage works carried out in 13 villages under Diyarbakır Batman Siirt Development Project.

In addition to the training provided by farmer training programs in the project regions, it is ensured that excessive and misuse of fertilizers and pesticides are prevented. For this purpose; 81 farmer awareness training sessions were held for 2,088 farmers under the Diyarbakır Batman Siirt Development Project (DBSDP). Awareness-raising training sections and tours were organized for 15,881 farmers under SEDP.

C.7.3.1. Monitoring of Agricultural Pollution

Efforts were initiated on monitoring network of nitrate pollution from agricultural sources, established to detect agricultural pollution and to identify Nitrate Sensitive Areas, in 2008. The monitoring network has been expanded so as to fully represent the agricultural pollution in the country and agricultural nitrate pollution monitoring practices are carried out in a total of 4,807 stations, 2,493 of which are above ground and 2,314 of groundwater.

Map 16 - Nitrate Pollution Monitoring Network
(Nitrate Information System-NİBİS, 2020)



All practices regarding the control and management of agricultural pollution are monitored through the web-based Nitrate Information System (NIBIS). The analysis results obtained from the monitoring network are recorded in the web-based Nitrate information system and evaluated in the studies of determination of Nitrate Sensitive Areas. **(http://tad.tarim.gov.tr/TadPortal/)**

Agricultural nitrate pollution monitoring studies are carried out using mobile analysis devices included in 20 Mobile Laboratories and Provincial Agriculture and Forestry Directorates. Analyses are conducted monthly for nitrate, total nitrogen, total phosphorus, orthophosphate, dissolved oxygen, pH, electrical conductivity, chlorophyll-a, and temperature in surface waters, analyses are conducted every three months for nitrate, ph, electrical conductivity, and temperature parameters in groundwaters.

C.7.3.2. Code of Good Agricultural Practices

The Code of Good Agricultural Practices, including the measures to be taken and regulations to be made by farmers to protect water against pollution caused by agricultural activities, was published in the Official Gazette No.29796, dated 11.02.2017 as an annex of the "Notification on Code of Good Agricultural Practices for the Prevention of Nitrate Pollution Caused by Agricultural Activities in Water" (Notification No: 2016/46).

In accordance with the Notification, it has been made obligatory for all enterprises to design and prepare an animal fertilizer management plan together with an impermeable animal fertilizer warehouse suitable for operating. Existing businesses must be adapted to the Code of Good Agricultural Practices within 4 years.

C.7.3.3. NitrateSensitive Areas and Pollution Prevention Action Plans

The General Directorate of Agricultural Reform of the Ministry of Agriculture and Forestry initiated the studies within the scope of the project, carried out by TUBITAK MAM to determine the NitrateSensitive Areas and to prepare the Action Plans to be implemented in these regions,in 2019. Within the scope of the study, it is planned to determine the NitrateVulnerable Areas, to prepare the action plans, and to prepare the cost-benefit analysis simultaneously for the measures to be implemented in the action plans. Studies have been completed in Gediz Basin and North Aegean Basin, which were selected as pilots, in 2019.

The studies regarding Yeşilırmak, Akarçay, Burdur, Kızılırmak, Küçük Menderes, Konya Closed, Meriç-Ergene, Büyük Menderes and Western Mediterranean Basins will be completed in 2020. Studies regarding 25 River Basins will be completed in 2022. It is aimed to contribute to the protection and sustainable use of our land and water resources with the measures to be implemented in the action plans prepared. It is aimed to monitor and report the effectiveness of the Nitrate Action Plans prepared by the Ministry of Agriculture and Forestry under the project on the Protection of Waters against Agricultural Pollution through Establishment of a Monitoring and Reporting Methodology for the Nitrate Action Plans, which was proposed by the General Directorate of Agrarian Reform to the Pre-Accession Financial Aid Program and of which tender process is ongoing. Creating an interface to integrate the monitoring methodology of Nitrate Action Plan to NİBİS to be established to monitor and report the effectiveness of Nitrate Action Plans.

It is aimed to increase the capacity of the personnel of the Ministry of Agriculture and Forestry in monitoring and reporting Nitrate Action Plans and to raise awareness for the recognition and acceptance of Nitrate Action Plans by farmers and stakeholders. The studies regarding the establishment of the legislation and infrastructure for harmonization of the Nitrate Directive within the scope of EU harmonization will be completed together with the completion of this project activities.

C.7.3.4. Agricultural Support and Incentives for Environmental Purposes

Necessary legal arrangements are made to associate the measures, to be implemented for the reduction and prevention of agricultural pollution, with supports. Grant support is provided for the applications regarding the storage, processing, and application of animal fertilizers to the land under suitable conditions within the scope of the Rural Development Investments Support Program and IPARD supports.

The 10th Development Plan includes the measures as "Measures to prevent water pollution from agricultural sources shall be extended" and "Environmental support and incentives, regarding increasing the quality of life in rural areas, transforming the countryside into protected, living and producing areas, shall be increased". Within the framework of the plan; it is aimed to encourage the use of animal and chemical fertilizers in accordance with the Code of Good Agricultural Practices and the use of animal fertilizers for agricultural purposes with supports, and to ensure a sustainable agricultural structure that does not harm the environment, soil and water resources.

C.8. Legislative Regulations and Developments in Water and Wastewater Management

The foundations of the legal regime, to which water resources are subject, are included in these regulations introduced through the 1982 Constitution and the Civil Code numbered 4721. Accordingly, in Article 168 of the 1982 Constitution titled *"Exploration and Exploitation of Natural Resources"; "Natural wealth and resources shall be placed under the control and at the disposal of the State. The right to explore and exploit them belongs to the State. The State may delegate this right to individuals or public corporations for specific periods. Of the natural wealth and resources, those to be explored and exploited by the State in partnership with individuals or public corporations, and those to be directly explored and exploited by individuals or public corporations shall be subject to the explicit permission of the law. The conditions to be observed in such cases by individuals and public corporations, the procedure and principles governing supervision and control by the State and the sanctions to be applied shall be prescribed by the Law".*

In accordance with the rule laid down by the Constitution, the qualifications of the State-owned water resources and the ways to benefit from them are regulated in the Civil Code numbered 4721. In this Law, waters are divided into two as public waters and waters subject to private property (private waters).

Although it is the rule that everyone can benefit from the general waters, the main ones being seas, large lakes, rivers, and groundwater, it is obligatory paying regard to the doctrine of prior appropriation. Accordingly, everyone can only benefit from the general waters provided that they do not violate the doctrine of prior appropriation. The doctrine of prior appropriation, which means a right of which the previous history and the use of otherwise isn't known, plays an important role in determining the way of benefiting from general waters. However, having a prior appropriation right does not mean being able to benefit from water unlimitedly. Because even the person with prior appropriation cannot benefit more than his general water needs. The prior appropriation cannot be extended to the detriment of third parties. In cases where the prior appropriation is not available in accordance with the rules developed through the decisions made by the Supreme Court, the right to benefit is determined in accordance with the customs in that region.[1]

The main characteristics of general waters are that, as a rule, everyone can benefit from these waters, they cannot be transferred and renounced, they are required to be registered in the water registry, and they are not eligible for acquisition by time-limits.[2] The first of the regulations in the Civil Law on general waters is the subject of the law, which regulates the subject of immovable property, its acquisition, and loss. Article 715 entitled *"The places with no property and the goods for benefit of the public". In accordance with this article; the places with no property and the goods for benefit of the public are under the jurisdiction and disposal of the State. Unless proven otherwise, public waters and non-arable places such as rocks, hills, mountains, glaciers, and the resources derived from them are not the property of anyone and cannot be subject to private property in any way. The acquisition, maintenance, protection, operation, and use of unattended places and public property is subject to the provisions of the special law. Another regulation regarding general waters is the one regarding the groundwater. This regulation is included in Article 756 of the Civil Code, which regulates the ownership and easement rights of source and groundwater. According to this: '... underground waters are generally beneficial to the public, and therefore, ownership of any land shall not cover the water under that land. Special law provisions regarding the way and extent of landowners' utilization from underground waters are reserved".*

1 M. Edip Doğrusöz, Sular Hukuku, Yetkin Yayınevi, Ankara, 1997, pg. 44.
2 Mustafa Karakaş, Su Hukuku Bağlamında Su Kaynaklarının Yönetimi, Kurumsal ve Hukuksal Yapı, Marmara Üniversitesi SBE Kamu Yönetimi ABD Yüksek Lisans Tezi, 2007,pg. 21.

As can be understood from the provision of the law above, waters whose benefits belong to the public cannot be subject to private property. Everyone can benefit from these in proportion to their needs, primarily for their drinking and utility water needs.[3]

Although it is the rule that everyone can benefit from the general waters, the main ones being seas, large lakes, rivers, and groundwater, it is obligatory paying regard to the doctrine of prior appropriation. Accordingly, everyone can only benefit from the general waters provided that they do not violate the doctrine of prior appropriation. The doctrine of prior appropriation, which means a right of which the previous history and the use of otherwise isn't known, plays an important role in determining the way of benefiting from general waters. However, having a prior appropriation right does not mean being able to benefit from water unlimitedly. Because even the person with prior appropriation cannot benefit more than his general water needs. The prior appropriation cannot be extended to the detriment of third parties and can also be proven by a witness or expert statement.

The private waters are the ones on which private property is allowed to be established. The source's being subject to private ownership depends on its coming off from a registered property, having a flow rate that does not exceed the limits of the property, having continuity, and not being harmful to the public. Waters that become streams or rivers as soon as they have cropped out are not considered as a resource.[4] The owner of the land where the source is born has unlimited power of disposition on the resource, except for the restrictions imposed by private rights on the resource and the public interest.[5] As a rule, water that can be subject to private property is spring waters in accordance with the Turkish Water Law. Under the Article 718 of the Turkish Civil Code regulating the content of immovable property: "Ownership of the land covers the space and layers both above and under the ground of the subject land, to the extent of benefits of such use. This property also includes structures, plants, and resources without prejudice to legal restrictions. "

Article 756 of the Turkish Civil Code regarding the right of ownership and easement in resources and groundwater: 'any spring is an integral part of the land, and the ownership of spring may be allowed only together with the ownership of the land. The right on the springs located on someone else's land is established by registration in the land registry as an easement right".

However, in accordance with the provision of Article 715 of the Civil Code titled 'Unowned places and public property "unowned places and properties whose benefits belong to the public shall be under the control and disposition of the State. Unless the contrary is proved, ownership of waters whose benefits belong to the public and places which are not suitable for agriculture, rocks, hills, mountains, glaciers, and resources extracted from such may not be subject to private ownership"

As it can be understood from this provision; the springs originated from areas not suitable for agriculture, from mountains and forests, and waters whose benefits belong to the public cannot be subject to private property, they are under the rule and disposition of the State.[6]

National Water Plan (2019-2023)

Establishment and implementation of our national water policy in general terms, within the context of embodying the goal of "Turkey with a National Water Policy" in the vision of 2023, was prepared with a participatory and holistic approach for sustainable management of our water resources in terms of quantity and quality, considering the balance of protection and use. It entered into force after being approved at the Water Management Coordination Board Meeting on 28.05.2019. The National Water

3 İlgün, M. G.: Su Davaları , Adalet Yayınevi, Ankara 2008, pg. 4.
4 Mustafa Karakaş, Su Hukuku Bağlamında Su Kaynaklarının Yönetimi, Kurumsal ve Hukuksal Yapı, Marmara Üniversitesi SBE Kamu Yönetimi ABD Yüksek Lisans Tezi, 2007, s. 48; M. E. Doğrusöz, 1997, pg. 40.
5 M. E. Doğrusöz, 1997, pg. 41.
6 Karakaş, M.: 2007, ibid, pg. 49.

Plan (NWP), which was published for the first time in Turkey, was developed by taking into account the current situation and future potential of the country's water resources and the climatic conditions that differ greatly according to the geographical regions of the country.

The main objective of the NWP is to complete the process of transition to basin-based water management under the coordination of the central government authority and the Ministry of Agriculture and Forestry with a participatory and holistic approach for sustainable use of Turkey's water resources in terms of quantity and quality. Its content includes the titles of Water Resources Management, Water Resources Data Status, Protection and Improvement of Water Resources in terms of Quantity, Quality and Ecosystems, Supply-Demand Balance, and Water Allocation, Finance, Budget and Business, Water Efficiency, Socio-Economic Analysis, Information and Decision Support Systems, Water Security and Water Policy which are the key areas of Water Cycle Management. The policies and targets produced and developed within the scope of the NWP are divided into two fixed terms as "Continuous" and "2019-2023", the years of the project cycle. In the context of preparation for the NWP; a "Working Group" was established under the responsibility of the General Directorate of Water Management, and periodic meetings were held within this group during September 2017-March 2018, and a base was prepared for the plan.

C.8.1. Water Management

The General Directorate of State Hydraulic Works (SHW) is a private budgeted investor institution with a public legal personality, responsible for the planning, development and operation of all water resources in our country. The General Directorate of State Hydraulic Works was established on 18 December 1953 with Law No. 6200 and was organized in 1954.

It operates under the Ministry of Agriculture and Forestry with the Presidential Decree No.1 on the Presidential Organization, published on 10.07.2018.

In addition to flood protection, spreading irrigated agriculture, producing hydroelectric energy, and supplying Drinking-Water to big cities as a public institution, as well as providing drinking, utility, and industrial water to settlements that are municipal organizations, SHW carries on its priority activities regarding dam works, which is its common point of the said four goals. Its duties are;

- Building dams,
- Building flood control structures,
- Building irrigation facilities,
- Rehabilitating rivers and swamps,
- Producing hydroelectric energy,
- Conducting any kinds of researches, projects, and constructions related to the above-mentioned duties,
- Operating and maintaining above-mentioned facilities,
- Building necessary facilities for recycling wastewaters or get them built,
- Checking whether the operationalized hydroelectric power is operated in accordance with the water usage rights agreements, and making all kinds of calculations and collection transactions related to them.
- Working in the field of duty on transboundary and border waters.
- Monitoring quality of surface waters and groundwaters and reporting any pollution of surface waters and groundwaters caused by wastewaters to the Ministry of Forestry and Water Affairs.
- Making water allocations, monitoring surface and groundwaters in terms of quality, reporting the situation to the relevant ministry in case of detection of contamination of surface and groundwater due to wastewater.

The Law on Underground Waters No. 167 of 16/12/1960 includes the following duties to be carried out by SHW;

- Drilling well or get them drilled for groundwater researches and investigations
- Conducting groundwater allocations,
- Protecting and registering groundwaters,
- Granting licenses for exploration, utilization, rehabilitation, and amendment.

The Law No. 1053 of 03/07/1968 on Supply of Drinking-Water to Ankara, Istanbul, and Metropolitan Cities with population of over 100,000 includes the following duties to be carried out by SHW;

- Building dams and distribution lines,
- Building water purification plants,
- Building water reservoirs.

While the abovementioned duties were entrusted to SHW, in line with the amendments in Article 10 of Law No. 5625 dated 18/04/2007, the population criteria were abolished and SHW became the authority in providing domestic and industrial water and building wastewater facilities, if needed, to all residential areas with a municipal organization. Furthermore, the title of Law No. 1053 has been changed to "Law on Supply of Drinking, Utilization and Industrial Water to Settlements with Municipal Organization".

According to Law No 167 Relative to Groundwaters (1960), groundwaters form part of national waters and shall be subject to State ownership and possession. Any spring is an integral part of the land, the ownership of spring may be allowed only together with the ownership of the land. Groundwaters are the waters for the public weal. Possession of the land shall not lead to possession of groundwaters under it. Special law provisions on the type and extent of utilization from groundwaters by landowners are reserved. All kinds of prospecting, utilization, protection, and registration of such waters shall be governed by the provisions of this Act. Property right of groundwaters is granted to State through this Act. A person upon whose land water has been discovered as a result of prospection under a license shall be authorized to make use of such water (within the frame of safe aquifer supply limits) and rights of use accorded by public institutions are nonsalable and unalienable.

The By Law on SHW Groundwater Measurement Systems No. 27957 dated 7/6/2011, is aimed to measure the number of groundwaters that have been drawn or will be drawn from wells, galleries, tunnels, and similar places according to utilization certificates granted under Law No. 167, by using measurement systems and to take this amount under control. On the other hand, necessary principles on maintaining the current status of groundwaters that are in good condition, preventing pollution and degradation of groundwaters, and improving the quality of these waters are designated in the "By Law on the Protection of Groundwater against Pollution and Degradation".

To subsidize reconstruction activities of municipalities, Belediyeler Bankası (Bank of Municipalities) was founded in 1933 under Law No. 2301, but in 1945 its duties were changed in a way to provide technical and financial support for all kind of infrastructure activities of municipalities under the Law No. 4759 and it gained the new title of "İller Bankası (The Bank of Provinces)". However, in the beginning, the duty of building domestic water supply facilities for residential areas with a population between 3,000 and 100,000 was imposed on the Bank of Municipalities, and in 1983, providing domestic water to residential areas with a population of over 1000.000, if city councils authorize the Bank for these activities, was also included in its duties. Within the Law No. 6107 on İller Bankası A.Ş (Bank of Provinces) entered in force after being published in the Official Gazette dated 8.2.2011, its duties were determined as providing consultancy services to provincial special administrations, municipalities, and subsidiaries,

conducting surveys, projects and construction activities for technical urban projects and infrastructure and superstructure works and exercising any kind of development and investment banking affairs

Many authorities, and responsibilities, such as building municipal water systems, sewerage systems, and treatment facilities, were granted to municipalities under Law No. 5393 on Municipalities (2005). Municipalities are generally regarded and evaluated as a whole to provide joint revenue for water and transportation services and cross-subsidization for public services. For local administrations that are not metropolitan municipalities, priority is given to water supply services instead of wastewater collection and treatment.

Serious problems about sewerage systems have been faced in metropolitan municipalities since the 1980s due to the population growth. This situation has necessitated the development of a new sewerage model that allows the integration of water and wastewater management. Starting with İstanbul, autonomous institutions, which are responsible for planning, project designing, and building processes of water and sewerage systems, have been founded in metropolitan municipalities since İstanbul Water and Sewerage Administration (İSKİ) was founded in 1981. İSKİ was founded as an independent institution from İstanbul Municipality at the beginning. However, after the municipality was restructured in 1984 as a metropolitan municipality, İSKi became an institution under İstanbul Metropolitan Municipality but with an autonomous budget. The water and sewerage administration model was created for Ankara in 1987, for İzmir and other metropolitan municipalities in 1989.

The following duties are assigned to the General Directorate of Environmental Management of the Ministry of Environment and Urbanization regarding water management within the framework of the Presidential Decree No. 1 on the Presidential Organization, published in the Official Gazette No. 30474, dated 10 July 2018;

- Preparing the legislation, developing standards, determining measurement, detection, and quality criteria for prevention and control of environmental pollution; issue opinions on environmental pollution according to the characteristics of the receiving environment,
- Determining and monitoring the implementation of procedures and principles on pollutive factors and elimination and control of pollution to protect the ground and surface waters, seas, and soil, to prevent and eliminate pollution; preparing emergency response plans and getting them prepared; determining appropriate technologies for the protection of the environment and determining the qualifications of facilities to be established within this purpose and taking necessary measures within this framework,
- Determining design principles and criteria of wastewater treatment plants together with the Ministry of Agriculture and Forestry and carrying out the approval procedures.

The following duties are assigned to the Ministry of Environment and Urbanization, General Directorate of Environmental Impact Assessment, Permit, and Inspection (article 104), established with the Presidential Decree No. 1 published on 10.07.2018;

- Monitoring the receiving environments, building the relevant infrastructure, determining measurement and analysis criteria concerning environmental pollution, implementing and ensuring implementation of these criteria; establishing and having established laboratories that will carry out all kinds of environmental measurements, monitoring, analysis, and control or making them established, doing accreditation works for these laboratories; determining the institutions that will carry out measurements for the receiving environments.
- Monitoring all kinds of activities and facilities aimed at preventing environmental pollution and improving environmental quality, taking and having the necessary measures taken, inspecting the facilities, and issuing environmental permits and licenses.

- Monitoring and inspecting the discharge, treatment, and disposal systems of activities and facilities that cause environmental pollution.

The duties of the General Directorate of Water Management of the Ministry of Agriculture and Forestry (article 421), established by the Presidential Decree No. 1 on the Presidential Organization published on 10.07.2018, are given below;

- Conducting activities to determine policies regarding the protection, improvement, and use of water resources,
- Preparing and having prepared the river basin management plans on basin-basis to protect and improve the ecological and chemical quality of the aquatic environment, taking into account the protection-use balance of water resources, including coastal waters, and carrying out legislative activities on integrated river basin management,
- Following the processes arising from the international conventions and other legislation regarding the protection and management of water resources, carrying out the activities related to transboundary and border waters in cooperation with relevant institutions,
- Creating a national water database,
- Identifying and monitoring the sensitive areas in terms of water pollution and the nitrate sensitive areas,
- Determining the design principles, norms, and criteria of drinking and utility water treatment plants, determining the institutions and organizations authorized to approve the projects, providing the training of the personnel who will operate the facilities, giving their certificates,
- Working on the effects of climate change on water resources,
- Determining, evaluating, updating, and monitoring the implementations regarding the measures related to the prevention of pollution on basin-basis together with the relevant institutions and organizations,
- Determining the goals, principles, and receiving environment standards for the protection of the quality and quantity of surface and ground waters together with the relevant institutions and organizations, monitoring or having monitored the water quality,
- Conducting studies to determine the strategies and policies regarding floods and preparing the relevant legislation and flood management plans,
- Ensuring the necessary coordination regarding the allocation of water resources on the sectoral basis in accordance with the river basin management plans,
- Performing the other duties assigned by the Minister.
- The public institutions and organizations are obliged to submit their water-related information and data to the General Directorate of Water Management, upon request, to be processed in the water database.

The Ministry of Foreign Affairs ensures that decisions, regarding transboundary waters, are taken in coordination with the relevant Ministries, especially the Ministry of Agriculture and Forestry.

The Ministry of Health has responsibilities concerning drinking and utility waters (municipal water), packaged waters (spring waters, drink waters, and natural mineral water), bathing waters, and geothermal waters that are used for health purposes. The Public Health Institution of Turkey designates the quality

standards regarding these waters to protect public health and conducts permission and monitoring processes necessary for compliance with these standards. The Department of Environmental Health of The Public Health Institution of Turkey has the following duties concerning water security:

- Participating in the research and development studies necessary for the supply of sufficient and healthy drinking-utility water to the residential areas and ensuring that necessary measures are taken, regulating these measures and training or having the implementers trained on these measures,
- Conducting studies on spring, drinking, drinking-utility water, natural mineral waters, pool waters, swimming areas, and thermal spring waters,
- Determining the indications of peloids used in thermal waters and thermal facilities and conducting approve processes of the natural mineral waters,

The Ministry of Health monitors the drinking – utility waters (municipal water and packaged water (spring water, Drinking-Water, and natural mineral waters) under the "By Law on Waters Intended for Human Consumption" and the "By Law on Natural Mineral Waters"; the swimming pool waters under the "By Law on Health Principles for Swimming Pools"; the bathing waters under the "By-Law on Bathing Water Quality", and the geothermal waters used for health purposes under the "By-Law on Hot Springs".

The General Directorate of Mineral Research and Exploration (MTA) carries out works especially on exploring geothermal and mineral water resources.

Turkish Statistical Institute (TURKSTAT) gathers data on domestic waters and wastewaters from the municipalities through surveys and publishes the obtained data. TURKSTAT gathers data on manufacturing industry establishments, thermal power plants, organized industrial zone directorates, and mining enterprises, as well as municipalities, through the surveys it conducts. The estimates are made for the villages in the light of data compiled from special provincial administrations.

The Ministry of Culture and Tourism is authorized for Drinking-Water supply and urban wastewater disposal in touristic areas.

Turkish Water Institute (SUEN) was established under a decision taken by the Council of Ministers on 10/10/2011. The duties of SUEN comprises; following the works, researches, and statistical activities of other national and international organizations on water and following the international developments, performing necessary activities for providing cooperation between national and international water sector, conducting projects with people and organizations that have become prominent in national and international sectors with their works, contributing to the development of opportunities and tools that are necessary for developing sustainable water policies and strategies towards solving global water problems, making scientific researches on developing national and international water policies and supporting such researches, supporting international forums, conferences, meetings, seminars, symposiums, and similar activities, organizing national and international training programs, cooperating with foreign organizations and institutions.

The Draft Water Law: The increasing population, industrialization, and climate change due to global warming in our country in recent years negatively affect water resources and make the sustainable protection of water an increasing need. While the demand for water resources and the pressure on water resources is increasing gradually in our country that is not rich in water resources, there is no national water law setting out the general principles and procedures regarding the protection and management of water. The Law on Waters, enacted in 1926, is not such as to meet the needs of Turkey of 2020. Planning the allocation of water for the sustainable management of water quantity, taking necessary measures for protection to ensure sustainable management water of quality, ensuring the coordination between different institutions and organizations competing for different purposes of use in terms of water resources and the draft water law, recently prepared in terms of harmonization with the European Union,

are of great importance. Furthermore, the current legislative regulations not only do not address all issues related to the management of the basin, of which effectiveness in water management has been accepted today, but also they do not cover all issues related to the holistic protection of water quality and quantity.

The Draft Water Law has been prepared to ensure the success of the protection efforts to be carried out by considering the protection-use balance by the state and ensure effective management of our water resources. Works and proceedings for the enactment of the said Draft are in progress.

The issue of "Enacting the Water Law" took place as the 14th action in the Second Agriculture and Forestry Council decisions, held between 18-21 November 2019 and announced to the public by our President Recep Tayyip Erdoğan on 21 November 2019 and "the decision of enacting the Water Law is planned to be implemented" by the end of 2020 for "more effective and more efficient management of our country's water resources"

C.8.2. Water and Wastewater Legislation

By-Law on Water Pollution Control: The By-Law on Water Pollution Control entered in force after being published in the Official Gazette No. 25687 dated 31.12.2004 with the purpose of determining the legal and technical procedures required for ensuring the protection and effective utilization of ground and surface waters potential of Turkey and conducting the prevention of water pollution activities in compliance with the sustainable development goals.

The By-Law includes the principles on the protection of waters, planning principles, and prohibitions on maintaining water quality, discharge principles of wastewater and procedures of discharge permits, prohibitions on marine pollution, principles on wastewater discharge, principles on wastewater infrastructure facilities, procedures, and principles on monitoring and inspection for preventing water pollution.

By-Law on Urban Wastewater Treatment: The content of the Council Directive 91/271 / EEC of 21 May 1991 on Urban Wastewater Treatment comprises the protection of the environment against the negative effects of the collection, treatment, and discharge of urban wastewater and wastewater discharge from certain industrial sectors. Collection, treatment, and discharge of urban and certain industrial wastewater discharged into sewage systems and monitoring, reporting, and supervision of wastewater discharge will be provided.

By-Law on Urban Wastewater Treatment was published and entered into force on January 8, 2006, within the framework of European Union legislative harmonization studies, with the same purpose. With this by-law, conducting advanced treatment was imposed as an obligation for the residential areas that are included in urban sensitive areas and have an equivalent population of more than 10,000.

Furthermore, it is aimed to determine the priorities by establishing a treatment facility taking into account the most appropriate treatment methods and pollutant loads for the treatment of domestic wastewater on a population basis, considering the equivalent populations and the receiving environment as well as the pollution levels in the receiving environment and other environmental factors, and by investigating its economical technical and social applicability so as to cover either the basin or the residential area of them both.

By-Law on Urban Wastewater Treatment has been implemented since 01.01.2018 by 5 Provisional Articles the By-Law on Water Pollution Control regarding the implementation of the provisions of the By-Law on Water Pollution Control related to domestic wastewater of areas with an equivalent population of 2000 and above until 31/12/2017 and the implementation of those of the By-Law on Urban Wastewater Treatment after this date instead of them.

Urban sensitive areas in our country have been determined and a deadline until 2023 has been given based on the By-Law on Wastewater Treatment to carry out the necessary transformations for the further treatment of wastewater from wastewater collection areas of more than 10,000 population equivalent to urban sensitive areas under the By-Law on the Determination of Sensitive Water Bodies and the Areas Affecting These Bodies and the Water Quality Improvement.

By Law on Procedures and Principles to Be Abided in Determining Tariffs for Wastewater Infrastructure and Domestic Solid Waste Disposal Facilities: according to the Article 11 of the Environmental Law No. 2872 amended by the Law No. 5491 dated 26 April 2006 on Amendments to Environmental Law and Article 11 of The Environmental Law No. 2872, those who use/will use wastewater infrastructure, regardless of whether they have a connection line or not, are obliged to pay for all the expenses made by administrations that are responsible for investment, operation, maintenance, rehabilitation and clearance of treatment systems in proportion to their pollution load and wastewater amount. Wastewater collection, treatment, and disposal fees are obtained from those who benefit from these services according to tariffs designated by the city council and other administrations authorized through this article. The money collected under this article cannot be used for purposes other than wastewater services.

Metropolitan municipalities and municipalities are obliged to establish and operate or ensure the establishment or operation of the domestic solid waste disposal facilities. Current and future beneficiaries of this service are obliged to participate in the investment, operation, maintenance, repair, and improvement expenses of the responsible administrations. Solid waste collection transportation and disposal fees are obtained from those who benefit from this service, according to the tariff determined by the municipal council. Fees collected under this article cannot be used other than services related to solid waste.

There are provisions as "the procedures and principles regarding the establishment, repair, improvement, operation of systems of the plants, enterprises and residential areas that are subject to treatment and disposal obligations, the treatment and disposal systems that must be established based on this obligation, wastewater treatment and pre-treatment systems, wastewater infrastructure and determination of their contribution to expenses, are regulated by the Ministry through by-laws".

"By-Law on Determining Tariffs for Wastewater Infrastructure and Domestic Solid Waste Disposal Facilities" entered into force after being published in the Official Gazette on 27 October 2010 based on the above provisions of the Environmental Law so as to ensure a regular minimum income flow for the protection of the environment and the sustainable and efficient execution of wastewater infrastructure service. The purpose of this By-Law is to establish, maintain, repair, operate, close and monitor wastewater infrastructure facilities and domestic solid waste disposal facilities and to ensure the sustainability of environmental infrastructure services through determination, adjustment and implementation of the full cost-based tariffs that can cover all services provided for these facilities by wastewater infrastructure managements, metropolitan municipalities, and municipalities. .

The commissioning periods of wastewater treatment plants have been determined under the provisional article 4 of the Environmental Law. Obligations have been imposed on municipalities and especially on Organized Industrial Areas to establish wastewater treatment plants. With this By-Law, it is aimed that those who cannot receive wastewater from wastewater infrastructure managements receive this fee, and wastewater infrastructure services are carried out in a sustainably and efficiently.

By-Law on Control of Pollution by Dangerous Substances in Water and its Environment: The purpose of this By-Law, published in Turkey with the number 26040 dated December 31, 2005, is to detect, prevent and gradually reduce the pollution caused by hazardous substances in water and its environment.

Council Directive 76/464/EEC on Pollution Caused by Certain Dangerous Substances Discharged into the Aquatic Environment dated 4 May 1976 was revised and Directive 2006/11/EC on Pollution Caused by Certain Dangerous Substances Discharged into The Aquatic Environment was published on 15 February 2006.

By-Law on Control of Pollution by Dangerous Substances in Water and its Environment was revised and published in the Official Gazette on 30 March 2010 to facilitate the implementation of the relevant directive under Turkey's current conditions.

This By-Law covers the technical and administrative principles regarding the determination of hazardous substances causing pollution in surface waters, estuary waters, regional waters, the preparation of pollution reduction programs, prevention and monitoring of pollution, preparation of an inventory of hazardous substances discharged into water, and determination of discharge standards and quality criteria.

By-Law on the Determination of Sensitive Water bodies and the Areas Affecting These Bodies and the Water Quality Improvement was entered into force after being published in the Official Gazette No. 645 dated 29.6.2011. The By-Law was prepared to determine the sensitive water bodies in terms of nutrients and the urban and nitrate sensitive areas affecting these bodies, to set out the principles and principles relevant to these, and to determine the necessary measures to be taken to improve the water quality in sensitive water bodies.

By-Law on the Preparation, Implementation, and Follow-Up of River Basin Management Plans entered into force after being published in the Official Gazette No. 28444 dated 17.10.2020 and regulates the procedures and principles regarding the preservation of the aboveground and undergroundwater bodies, which are in good water status in terms of physicochemical, chemical and ecological quality components, in its current form with a holistic approach, making the degraded ones in good water status, ensuring sustainable use by allocating them in accordance with their priorities, preparing, implementing and monitoring the national water plan and basin-scale management plans.

By-Law on the Quality and Treatment of Drinking-Water Resources : The purpose of the by-law published in the Official Gazette No. 30823 dated 06.07. 2019 is to determine the principles and quality criteria regarding the Drinking-Water supplied or planned to be supplied and the issues related to the determination of treatment classes that should be determined to use the water as drinking and potable water and the treatment efficiency, as well.

This By-Law covers the issues regarding the quality category of the water supplied or planned to be supplied, the treatment classes to be applied according to the category in which the water is included, determination of the treatment efficiency of Drinking-Water treatment plants by sampling and analysis frequencies for parameters to be monitored in these waters.

By-Law on the Protection of Drinking-Utility Water Basins entered into force after being published in the Official Gazette No. 30224 dated 28.10.2017. The By-Law regulates the principles and procedures for the protection and improvement of the quality and quantity of all surface and groundwater resources that are supplied or planned to be supplied as drinking and utility water.

Within the scope of the By-Law ; the basin protection plans are prepared through a scientific study by taking into account the characteristics of each drinking-utility water basin to protect and improve the quality of drinking-utility water resources in a way that does not endanger human health and minimizes the treatment needs and costs required for use as drinking-utility water.

Currently (as of May 2020), special protection provisions have been determined for 17 drinking-utility water basins within the scope of the said By-Law, and the provisions of the By-Law on the Protection of Drinking-Potable Water Basins are valid for drinking-utility water basins of which special protection plan has not yet been prepared.

Drinking-Water Protection Plans:

- Atatürk Dam Reservoir Special Provisions
- Eğirdir Lake Special Provisions
- Lake Beyşehir Special Provisions
- Gördes Dam Reservoir Special Provisions
- Karacaören 1 and 2 Dam Reservoirs Special Provisions
- Kartalkaya Dam Reservoir Basin Protection Plan
- Kazandere and Pabuçdere Dam Reservoir Special Provisions
- Mamasın Dam Reservoir Special Provisions
- Porsuk Dam Reservoir Special Provisions
- Büyükçekmece Dam Lake Basin Protection Plan
- Elmalı 1-2 Dam Basin Protection Plan
- Gökçe Dam Reservoir Basin and Kurtdere Diversion Special Provisions and Protection Plan
- Special Provisions and Protection Plan for Çamlıdere Dam and Gerede Işıklı Regulator Basins
- Gönen Dam Lake and Kumköy Regulator Special Provisions
- Kandıra Namazgah Dam Lake and Basin Special Provisions
- Yuvacık Dam Lake Basin Special Provisions
- Melen Dam Lake Basin Special Provisions

By-Law on Monitoring the Surface Water and Groundwater: The purpose of this By-Law is to reveal the current situation of all surface waters and groundwater in terms of quantity, quality, and hydromorphological elements throughout the country, to monitor the waters with an approach based on the integrity of the ecosystem, to ensure standardization in monitoring and coordination between monitoring institutions and organizations.

By-Law on Water Allocations: By-Law on Water Allocations was prepared based on the Additional 7th and Provisional Articles of the Law No. 6200 on the Organization and Duties of the General Directorate of State Hydraulic Works and Article 121 of the Presidential Decree on the Organization of Related Institutions and Organizations and Other Institutions and Organizations Affiliated to Ministries no.4. published in the Official Gazette No. 30974 dated 10.12.2019 to ensure the establishment of national legislation that is more easily accessible and known by the addressees of water allocation and user requests. The procedures and principles for obtaining the opinion of the General Directorate of State Hydraulic Works in transactions such as allocation, leasing, and licensing of water resources by other public institutions and organizations and exclusively to the General Directorate of State Hydraulic Works and the principles and procedures for water allocations to be made by the Directorate have been determined under this by-law published in the Official Gazette No. 30974 dated 10.12.2019.

"By-Law on Preparation, Implementation, and Monitoring of Flood Management Plans" was put into effect for the preparation, implementation, and monitoring of flood management plans, and the assessment of flood risks at the basin scale to reduce the negative effects of floods on human health, soil, environment, natural assets, natural sites, specially protected environment areas, cultural heritage, social and economic activities.

By-Law on the Procedures and Principles to be Followed in the Utilization of Incentive Measures of Wastewater Treatment Plants in accordance with Article 29 of the Environmental Law: In general, the excessive energy needs of wastewater treatment plants increase operating costs and negatively affect the operation of the facility. In this context, "By-Law on the Procedures and Principles to be Followed in the Utilization of Incentive Measures of Wastewater Treatment Plants in accordance with Article 29 of the Environmental Law" came into force after being published in the Official Gazette No. 27716 dated 01.10.2010 to ensure the efficient operation of wastewater treatment plants and to increase the water quality of the receiving environment and to protect natural resources.

Within the scope of the By-Law, up to fifty percent of the energy costs of the wastewater treatment plants, operated in accordance with the legislation, can be met. The number of facilities that have received Reimbursement Certificate to benefit from the Electricity Incentive reached up to 773 at the end of 2019. Within the scope of the By-Law, 22.8 Million TL was paid to 172 facilities in 2011, 26.6 Million TL was paid to 212 plants in 2012, 30.2 Million TL was paid to 207 plants in 2013, 30.4 Million TL was paid to 225 plants in 2014, 46.4 Million TL was paid to 294 plants in 2015 TL, 59.5 million TL was paid to 375 plants in 2016, 62.8 million TL was paid to 463 facilities in 2017, 70.5 million TL was paid to 525 plants in 2018, and 103.6 million TL was paid to 567 plants in 2019.

By-Law on the Use of Domestic and Urban Treatment Sludges in Soil: The By-Law covers the technical and administrative principles regarding the controlled use of the treatment sludge resulting from the treatment of domestic and urban wastewater in a way that does not harm the soil, plant, animal, and human.

In accordance with the provisions of the By-Law, stabilization of the treatment sludge obtained as a result of the treatment of domestic and urban wastewater in the soil is compulsory and subject to permission.

The use of treatment sludge in unpermitted areas is prohibited. The private and public institutions operating the treatment plant are obliged to fulfill the permit procedures laid down under the By-Law and to comply with the provisions regarding the use restrictions and prohibitions of stabilized treatment sludge for the treatment sludge to be used in the soil.

By-Law on Control of Soil Pollution and Areas of Point Source Pollution: The By-Law entered into force after being published in the Official Gazette No. 27605 dated 08 June 2010. It covers the technical and administrative procedures and principles regarding the prevention of soil pollution, determination and recording of the areas and sectors where pollution is present or likely to occur, cleaning and monitoring contaminated soils and fields.

Audit Guide and Commission Guide to ensure unity in inspection and commission studies and methods and technology for cleaning contaminated sites Contaminated Site Cleaning / Remediation Technologies Guide, which includes information on selection, has been prepared to be used in the by-law practices.

Contaminated Site Cleaning / Remediation Technologies Guide which includes information on technology selection and methods for cleaning contaminated sites through Audit Guide and Commission Guide to ensure unity in inspection and commission studies of Contaminated Sites Information System (web-based software), Contaminated Site Survey Technical Guide, Contaminated Site Risk Assessment Technical Guide, Contaminated Site Cleaning and Monitoring Technical Guide was prepared to be used in the applications of the By-Law.

Under the By-Law on the Protection of Groundwater against Pollution and Deterioration, (OG dated 07.04.2012 and numbered 28257), the necessary principles were determined for the protection of the current condition of the groundwater, prevention of pollution and deterioration of groundwater, and improvement of these waters. The By-Law in question has been revised by the publication of the By-Law Amending the By-Law on the Protection of Groundwater Against Pollution and Deterioration (OG dated 22.05.2015 and numbered 29363).

By-Law on Quality of Surface Waters Used or Planned to Use for Drinking-Water (published in the Official Gazette No. 28338 dated 29.06.2012): The By-Law on Quality of Surface Waters Used or Planned to Use for Drinking-Water covers the issues of determination of characteristics of surface waters used or planned to be used for drinking-water, treatment classes to be applied according to the category in which water is included, sampling and analysis frequencies for the parameters to be monitored in these waters, and determination of quality categories.

Under the said By-Law;

Surface waters from which drinking and potable water are obtained or planned to be obtained are divided into three different categories as A1, A2, and A3, according to the mandatory and guideline values given for all parameters included in the annex of the By-Law, and the following treatment classes are determined for each category. Of quality categories of drinking and utility water,

a) A1: represents potable water after simple physical treatment, and disinfection,

b) A2: represents potable water after physical treatment, chemical treatment, and disinfection,

c) A3: represents potable water after physical and chemical treatment, advanced treatment, and disinfection.

By-Law on the Protection and Improvement of the Waters Inhabited by Trout and Carp Fish (OG dated 12.01.2014 and numbered 28880) regulates the procedures and principles required to protect and improve the quality of the freshwater inhabited by naturally diverse fish species and to establish monitoring and pollution reduction programs in these waters.

This By-Law embodies the issues regarding the determination of the water quality parameter values of the waters in the trout and the carp zones determined by the Ministry of Agriculture and Forestry, which require improvement and protection, monitor of the compliance of these waters to the parameter values and protection of them by creating monitoring programs, the establishment, implementation and control of a program to reduce the pollution load. The provisions of this By-Law do not cover the water in artificial fish ponds used for aquaculture. The action plan studies for the implementation of the said by-law requirements are in progress.

By-Law on Protection of Water Basins and Preparation of Management Plans: The By-Law entered into force after being published in the Official Gazette No. 28444 dated 17.10.2012. The purpose of the By-Law is to regulate the principles and procedures for the protection of surface waters and groundwater in terms of quantity, physical, chemical, and ecological quality with a holistic approach and preparation of water basin management plans.

By-Law on Water Audit and Water Losses Control in Irrigation Systems aims to reduce the irrigation water supply, distribution, and usage costs by efficient use of irrigation water in irrigation systems, ensuring water savings, reducing losses, and preventing unauthorized use.

By-Law on Surface Water Quality was prepared for specifying the procedures and principles for the measures to be taken regarding the determination and classification of the biological, chemical, physicochemical, and hydromorphological qualities of surface waters and coastal and transitional waters, monitoring the quality and amount of the water, presenting and maintaining the purposes of using these waters in line with sustainable development goals by considering the balance of conservation and use, and the achievement of good water status, and it was published in the Official Gazette No 28483 dated 30.11.2012.

With the said By-Law, the priority substances especially on environmental targets, specific pollutants, environmental quality standards, measures program, pressure-effects evaluation related to water quality and classification of European Union Water Protection Directive 2000/60/EC and Directive 2013/39 / EU and the sections regarding the environmental quality standards have been harmonized in line with national requirements.

By-Law on Monitoring Surface Waters and Groundwater: Issues related to monitoring the receiving environment quality in surface and underground waters in our country are addressed within the scope of the requirements of Article 8 and Annex-5 of the Water Framework Directive within the process of harmonization with the EU Legislation. The By-Law entered into force after being published in the Official Gazette No. 28910 dated 11.02.2014 within the scope of harmonization of the Water Framework Directive with the legislation of our country. Provisions of Article 8 and Annex-5 of the Water Framework Directive have been integrated into our national legislation under this By-Law.

The By-Law aims to reveal the current situation of all surface waters and groundwater in terms of quantity, quality, and hydromorphological elements throughout the country, to monitor waters with an approach based on ecosystem integrity, to ensure standardization in monitoring and coordination between monitoring institutions and organizations.

The By-Law covers the issues on monitoring of intra-continental surface, underground, transitional, and natural mineral waters, including coastal waters at the points where water resources flow into the sea, except for other coastal waters, geothermal resources, and seawaters regardless of their intended purposes of use.

The main objective of the By-Law is to establish a National Monitoring Network by preparing Monitoring Programs and collecting all the obtained data under the National Water Information System. In this framework, while creating monitoring programs, the pressures on the surface and underground waters are identified, and subsequently, studies are carried out to determine the monitoring points, parameters to be monitored, and the monitoring frequencies.

Furthermore, issues regarding the establishment of real-time monitoring systems are included within the scope of the aforementioned By-Law, and currently, water quality is monitored instantly through five (5) real-time monitoring stations in the Ergene-Meriç Basin and four (4) those in the Büyük Menderes Basin. Works on expanding the real-time monitoring stations throughout Turkey are in progress.

The monitoring parameters included within the scope of the monitoring programs were incorporated into the monitoring programs to be carried out at certain frequencies and at a level to reflect the pressures on the basin basis. These parameters include 116 pollutants and 45 priority substances specific to our country, as well as basic chemical and physicochemical parameters, biological and hydromorphological quality elements. Moreover, hazardous chemicals that have been determined specific to our country are also included to reveal the pollution caused by the pressures in basins.

Preparation of monitoring programs for our country, which has 25 river basins, was completed a the end of 2015.

By-Law on Control of Water Losses in Drinking-Water Supply and Distribution Systems was published in the Official Gazette No. 28894 dated 08.05.2014. The By-Law was enacted to ensure the control of water losses in drinking-utility water supply and distribution systems for effective use of drinking-utility water and prevention of waste in parallel with protecting water resources and increasing their efficiency.

Communiqué on the Determination of Environmental Objectives for Surface Water bodies: The purpose of this communiqué, published with the number of 31192 dated 21.07.2020, is to regulate the procedures and principles regarding determining the environmental objectives to be achieved for all surface water bodies, including coastal and transitional waters, to reach a good condition and to specify the water quality class.

This Communiqué was prepared based on the of Articles 410 and 421 of the Presidential Decree No. 1 on the Presidential Organization published in the Official Gazette No. 30474 dated 10/7/2018 and the Articles 9 and 20 of the By-Law on Surface Water Quality published in the Official Gazette No. 28483 dated 30/11/2012.

Communiqué on the Technical Procedures regarding the By-Law on Control of Water Losses in Drinking-Water Supply and Distribution Systems: It was published in the Official Gazette No. 29418 dated 16.07.2015. The measures to be taken to control water losses in drinking-utility water supply and distribution systems were determined under the Communiqué.

Communiqué on Sampling and Analysis Methods of By-Law on Water Pollution Control: The purpose of this communique, published with the number 27372 and dated 10.10.2009, is to specify procedures and principles regarding the determinatinion of the quality of the aquatic environment, continuous or intermittent sample taking from water when domestic and industrial wastewaters are discharged into wastewater infrastructure facilities or into receiving environments and measurement / analysis methods of the quality parameters foreseen to be inspected in accordance with the relevant provisions of the By-Law on Water Pollution Control.

This Communique comprises the principles of sampling and storage, sample protection techniques, sample storage methods, sampling procedures for wastewater analysis, sampling from surface and ground waters and seas, and analysis of samples taken from seas and ships to detect the pollution caused by ships.

By-Law on Water Pollution Control Administrative Procedures Communiqué: This Communiqué was prepared and published in the Official Gazette No. 27372 dated 10 October 2009 to regulate the administrative procedures and practices related to the responsibility and permission codes stipulated by the Water Pollution Control By-Law, published in the Official Gazette No. 25687dated 31.12.2004.

The Communiqué covers the principles of obtaining permission for the direct discharge of all kinds of urban, domestic and / or industrial wastewater into the receiving environment.

The wastewater generated as a result of all kinds of activities must be monitored according to their flow rates according to the Communiqué on Sampling and Analysis Methods and Administrative Procedures issued based on the By-Law on Water Pollution Control.

The monitoring of wastewater from the fishing sector is carried out within the framework of this table. However, since the flow rate of the water used in the sector is very high, monitoring frequencies vary

between twice a week and once a month, and this situation brings additional analysis load to the sector. Therefore, the fourth article of the Communiqué on Sampling and Analysis Methods and the 5th article of the Administrative Procedures Communiqué have been regulated after the evaluation of the demands and complaints about the arrangements in the current By-Law since the pollution load of the wastewater of these facilities is lower compared to other sectors. The opinions of the institutions were taken regarding the by-laws and the drafts were sent to the Presidency for publication.

Communiqué on Technical Personnel Working in Wastewater Treatment Plants: The importance of qualified personnel employment, for ensuring the operation of the wastewater treatment plants in accordance with the legislation, was recognized and the need for a by-law in this direction was emerged as a result of the "Project on Determination of the Current Status of Domestic/Urban Wastewater Treatment Plants and Determining the Need for Revision" carried out by the Ministry of Environment and Urbanization in 2016. As a result of the studies conducted, the Communiqué on Technical Personnel Working in Wastewater Treatment Plants was prepared and entered into force after being published in the Official Gazette no. 30782 dated 23.05.2019.

Under the Communiqué; the qualifications of the plant supervisor and technical staff, who need to be operated according to the type and capacity of the wastewater treatment plant to ensure the effective operation of the wastewater treatment plants, have been specified, and the duties, authorities, and responsibilities of the plant supervisors and technical staff have been defined and regulations have been made for the proper operation of wastewater treatment facilities by the qualified staff.

Communiqué on Integrated Pollution and Prevention Control in Textile Sector: Communiqué on Integrated Pollution and Prevention. Control in Textile Sector published in the Official Gazette No. 28142 dated 14 December 2011 to ensure the use of the best available techniques and effective use of raw materials and energy through the control of all kinds of emissions, discharge, and wastes to the water/air/soil during production for minimizing the negative effects of the textile sector on the environment and ensuring environmentally compatible management.

The communiqué covers textile facilities with an installed capacity of over 10 tons/day where sizing, washing, de-sizing, mercerization, bleaching, dyeing-printing, finishing, and other finishing processes are carried out. The facilities in question are responsible for applying the best available techniques within the scope of the Communiqué, presenting the production plans, and reporting the developments within the framework of the targets set in the production plans.

However, a need to revise some issues of the circular arose due to some provisions in the Circular that were difficult to implement economically and technically during the implementation of the Communiqué and Communiqué on the Amendment of the Communiqué on Integrated Pollution Prevention and Control in Textile Sector entered in force after being published in the Official Gazette No. 29291 dated 10.03.2015. With the amendments made on the circular, the facilities that apply mercerization over 1 ton/day became liable to recover alkali so as to contribute to the process of solving problems of conductivity and salinity in waters. Additionally, within the scope of the amendment of the Communiqué, the application of different Best Available Techniques (BAT) presented in Cleaner Production Plans (CPP) and not included in the Communiqué has been made possible.

Sensitive and Less-Sensitive Water Areas Communiqué concerning By-Law on Urban Wastewater Treatment: "Sensitive and Less-Sensitive Water Areas Communiqué concerning By-Law on Urban Wastewater Treatment" entered in force after being published in the Official Gazette No. 27271 dated 27 June 2009 to determine sensitive and less sensitive water areas in our country regarding Drinking-Water basins and lakes, bays ,and gulfs with eutrophication risk.

The purpose of the communiqué is to identify and monitor sensitive water areas and less sensitive water areas and to determine the procedures and principles that the urban wastewater discharging to these areas will be subject to. Sensitive Basins include the closed basins of Konya, Burdur, Van Lake, Akarçay, and the Ilısu dam basin. Moreover, the basins of surface water resources that are supplied or included in the investment program to supply drinking and utility water are defined as sensitive in the communique. Sensitive bays, gulfs, and coasts are given in a table. The sensitive, less sensitive, normal, and gray areas that have been determined should be reviewed every four years according to the results of the monitoring studies to be conducted/conducted.

Communiqué on the Establishment, Duties, Working Procedures and Principles of Basin Management Committees was published in the Official Gazette No. 29361 dated 20.05.2015. The purpose of the Communiqué is to regulate the necessary procedures and principles for the establishment and maintenance of Basin Management Committees to ensure inter-agency coordination and follow-up of the practices for the preparation, implementation and monitoring of basin protection action plans, basin, flood, and drought management plans.

Communiqué on Sampling of Surface Water, Groundwater and Sediment and Biological Sampling: The Communiqué was published in the Official Gazette No. 29274 dated 21.02.2015. the procedures and principles regarding sampling from the surface and underground waters and sediment, transporting, preserving and storing of samples and sampling and preserving biological quality elements in surface waters are determined with the said water communiqué. With the aforementioned Communiqué, practices related to the process that should be followed, from taking representative samples from receiving environments to analyzing the pollutant parameters included in the monitoring programs, were defined.

Communiqué on Continuous Wastewater Monitoring Systems: 290 wastewater treatment plants are monitored instantly 24/7 with Continuous Wastewater Monitoring Systems, and data are collected and evaluated in the Ministry data center. The parameters being monitored are the COD and TSS parameters together with physical parameters such as pH, conductivity, temperature, dissolved oxygen, and flow rate. However, in addition to the current monitoring practice in the basins, studies have been completed to apply it to facilities with a capacity of less than 10,000 m^3/day, and the Communiqué on the Amendment of the Communiqué on Continuous Wastewater Monitoring Systems entered into force after being published in the Official Gazette No. 30833 dated July 16, 2019. The obligation to establish a continuous wastewater monitoring system, which is valid for wastewater treatment plants with an installed capacity of 10,000 m^3/day or more, has been made compulsory for facilities with an installed capacity of 5,000 m^3/day and above with the new communiqué. A 2-year transition period has been granted for facilities with an installed capacity of 5,000 m^3/day and above, which have been included in the scope of the Communiqué for the first time in terms of installed capacity.

Within the scope of the Communiqué, automatic sampling devices are installed, according to the warning in case of exceeding the limit, in facilities where COD and TSS parameters are monitored, and the system is used for early warning. In case of exceeding the limits, the samples taken under the supervision of our provincial directorates are sent to authorized laboratories and necessary legal actions are initiated.

Username and password are defined for both facilities and Provincial Directorates of Environment and Urbanization to log into the system from the internet environment and data is accessed with the web software of the continuous monitoring center (sim.csb.gov.tr).

Data from the treatment facilities on flow, pH, Conductivity, Dissolved Oxygen, Temperature, and COD, TSS are transmitted online 24/7 to the Central Database of the Ministry of Environment and Urbanization in 5-minute averages as a result of the aforementioned continuous monitoring studies.

The data in question serves as a decision support system at the level of our provincial directorates and the senior management of the Ministry of Environment and Urbanization, enables the analysis of the

facilities on a sectoral basis, and provides data for the guidance of By-Law on Water Pollution Control (WPCR) sector tables. Thanks to these data, a remote and effective control mechanism were developed in treatment facilities that ensure to take samples in case of an alarm.

Legislative updates are made in the light of the experiences gained through the implementation of Continuous Wastewater Monitoring Systems and updates are provided by following the international literature. Effective follow-ups will contribute positively to human and environmental health.

Communiqué on Disinfection Techniques: the communique entered into force after being published in the Official Gazette No. 29457 dated 26 August 2015. The communique was prepared to choose a suitable disinfection method so as to ensure the safety of the Drinking-Water until it reaches the end consumer in residential areas with a population of 10,000 and below, to ensure proper application of the disinfection method, and to provide effective control of the process. The communique requires that the disinfection method is chosen according to Necessary Criteria for Choosing Disinfection Method by considering the provisions on method selection and application in the annex of the communique. According to the provisions of the communique, disinfection equipment is operated safely by considering the table including the points to consider.

Communiqué on Protection of Stagnant Inland Surface Waters against Eutrophication: It is aimed to protect lakes, dam reservoirs, and ponds against eutrophication and provide sustainable utilization of these waters within the scope of the communique published in the Official Gazette No. 28925 dated 26.02.2014. It is stated in the 9th article of the Communiqué that the water quality assessment regarding the area where the fish farming facilities will be established according to the analysis results given in Annex-6 Table 9 of the By-Law on Above Groundwater Quality, which was published in the Official Gazette dated 30.11.2012 and numbered 28483 until the analysis capacity of the dam lake and ponds is determined.

Communiqué on the Establishment, Duties, Working Procedures, and Principles of the Basin Management Central Board, Basin Management Committees and Provincial Water Management Coordination Boards: The Communiqué regulating the establishment, duties, working procedures, and principles of the Basin Management Central Board, Basin Management Committees, and Provincial Water Management Coordination Boards, entered into force after being published in the Official Gazette No. 30659 dated 18 January 2019 for the effective implementation of basin-scale plans prepared for the protection and improvement of water resources and ensuring stakeholder participation.

Communiqué on Procedures and Principles Regarding the Preparation of Drinking-Utility Water Basin Protection Plan: The Communiqué regulating the technical principles regarding the preparation, approval, effectiveness, amendment, and implementation of conservation plans entered into force after being published in the Official Gazette No. 30692 dated 20.02.2019.

Communiqué on Technical Procedures for Drinking-Water Treatment Plants: The purpose of the Communiqué, published in the Official Gazette No. 31061 dated 07.03.2020, is to regulate the design principles and norms of Drinking-Water treatment facilities to be built for the treatment of water supplied from the surface and groundwater sources. This Communiqué covers the technical procedures to be applied during the design and operation of Drinking-Water treatment plants.

Circular on Drinking-Water Treatment Plant Project Approval, Circular on Drinking-Water Treatment Plant Project Approval, The purpose of this Circular No. 2020/1 dated 07.05.2020 is to meet the drinking water standards determined by the By-Law on Water Intended for Human Consumption of the outlet water of the Drinking-Water treatment plants. Moreover, the the Circular aims to ensure the selection of the appropriate treatment process, which will bring the quality of the plant outlet water to A1 class that can be used as drinking and potable water specified in Annex 1 of the By-Law on the Quality and Treatment of Drinking Water Supplied Water, for the parameters not included in the By-Law on Water for Human Consumption.

This Circular covers the information regarding the preparation of the preliminary project (preliminary project) for Drinking-Water treatment plants with a capacity of 2,000 m^3/day and above and submitting it to the General Directorate of Water Management for approval.

Circular on Wastewater Information System: all wastewater treatment plants in our country, of which wastewater was discharged into receiving environments or utilized as recycled water, were given an identity document under Circular No. 2015/6 " on Wastewater Treatment Plants Identity Certificate " published on 05.05.2015. The processes of issuance of the Wastewater Treatment Facility Energy Incentive and Wastewater Treatment Facility Identity Certificate have been integrated into the Wastewater Information System.

The system is on the Wastewater Information System at https://ecbs.cevre.gov.tr/

Circular on the Restriction of Discharge Standards in the Ergene River: The Circular No. 2018/2 on "Restriction of Discharge Standards in the Ergene River" published on 01.03.2018 based on the 38th Article of the By-Law on Water Pollution Control which stated that The Ministry shall impose necessary restrictions on existing wastewater discharges beyond the limits outlined in this By-Law to prevent misuse of a receiving environment or to improve its quality until the Basin Protection Plan is prepared as a result of scientific studies by considering minimum flow and pollution rate of the water resources in the receiving environment. The necessary restrictions are made in the wastewater discharge limits as a result of the calculations to be made taking into account the limit values in Table 1 included in the annex of this By-Law. was repealed and the Circular No 2019/17 dated 26.12.2019 was put into effect.

It is required with the Circular that the individual industrial facilities discharging to the Ergene Basin, the domestic/urban wastewater treatment facilities will be managed and the organized industrial zones whose wastewater treatment plant construction have been completed will meet the restricted COD discharge standards. Moreover, the organized industrial zones that will be connected to the Marmara Deep-Sea Discharge system must also be connected on the dates specified in the Circular. It is also required that industrial facilities within the OIZ comply with the discharge standards in the Annex of the By-Law on Water Pollution Control until the connections are made.

Circular on Approval of the Projects of Wastewater Treatment Facilities and Deep-sea Discharge Facilities: Before the construction phase of wastewater treatment plants to protect the water resources in Turkey and to ensure sustainable utility in line with the interests of the country; the Ministry of Environment and Urbanization has carried out wastewater treatment plant project approval works and operations since 2004 to ensure that wastewater treatment technologies that will provide the desired level of treatment efficiency and have appropriate investment and operating costs. The project approval process for a total of 4,397 wastewater treatment facilities has been completed.

Circular on Technical Issues to be Followed in the Management of Wastewater Generated in Olive Oil Facilities: Circular No. 2015/10 on Technical Issues to be Followed in the Management of Wastewater Generated in Olive Oil Facilities entered into force after being published on 17.11.2015., it is aimed with the circular to ensure the management of olive blackwater and other wastewater resulting from olive oil production without harming the environment and human health.

Circular on Precautions on COVID-19 Outbreak and Wastewater Management: In addition to the measures taken in Wastewater Treatment to prevent the spread of the COVID-19 virus during the epidemic, the "Circular on Measures on the COVID-19 Outbreak and Wastewater Management" numbered 2020/13 entered into force on ;

- Disinfecting the treated wastewater used in irrigation of plants and green areas,

- Not allowing activities such as water sports or grain washing, etc., in the rivers where the treated wastewater is discharged or applying disinfection,
- Showing the necessary sensitivity in compliance with Occupational Health and Safety procedures and hygiene rules.

The Ministry of Environment and Urbanization aims to ensure that all municipalities have wastewater treatment facilities in 2023, the 100th anniversary of our Republic.

To achieve this goal, it is highly important to establish the legal infrastructure and to create a financial model necessary for the professional construction and operation of wastewater treatment facilities by the private sector which was built by various institutions but not operated due to technical deficiencies of wastewater infrastructure management and wastewater treatment facilities that cannot be built due to financial problems and for the transfer of it to the wastewater infrastructure management at the end of its term.

The "Research Project on the Public-Private Partnership" has been carried out by the Ministry of Environment and Urbanization in the Construction and Operation of Wastewater Treatment Plants and a Draft Law has been created within the scope of the project to create this model. Following the decision taken to regulate the Draft as an additional article to the Build-Operate-Transfer Law No. 3996, the Draft Law on Making Amendments to the Law No. 3996 on Making Some Investments and Services within the Framework of Build-Operate-Transfer Model has been prepared by the Presidency Strategy and Budget Department and the Ministry of Environment and Urbanization processes regarding the publication of the draft law are still on progress .

Resources

Ministry of Environment and Urbanization

- General Directorate of Environmental Management
- Directorate General of Environmental Impact Assessment, Permit and Inspection

Ministry of Culture and Tourism

Ministry of Agriculture and Forestry

Ministry of Transportation and Infrastructure

General Directorate of State Hydraulic Works

Turkish Statistical Institute

Guidance Document for Determining Environmental Targets Required to Achieve Good Condition of Surface Water bodies, Ministry of Agriculture and Forestry, 2019

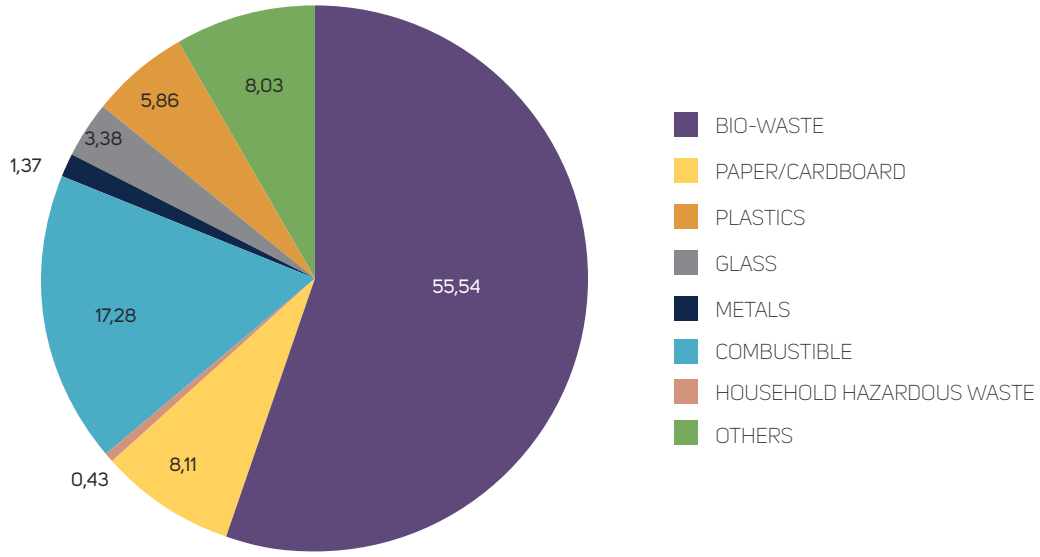
D. WASTE

D. WASTE

D.1. Municipal Wastes (Solid Waste Disposal Facilities)

Municipal wastes include household waste and trade, industrial and institutional wastes similar in nature and composition to the household of which the municipality is responsible for the management. The general composition of the municipal wastes is shown in Graph 31.

Graph 31 - Composition of Municipal Wastes since 2016
(National Waste Management Plan and Action Plan, Ministry of Environment and Urbanization,2016)



Bio-waste: Involves biodegradable park and garden wastes and kitchen wastes generated from houses, restaurants, and catering companies.

Combustible Waste: Combustibles are listed as diapers/nappies, cloth/textile, a piece of a shoe, pillow, rug, bag, etc. in the guidance document prepared under the Circular No: 2007/10.

The whole legal legislation relevant to the issue is composed of; Environment Law No. 2872, Law No. 5216 on Metropolitan Municipalities, Municipality Law No.5393, By-Law on Waste Management, By-Law on Zero Waste, By-Law on Organized Landfill of Wastes, By-Law on Excavation Soil, Construction and Demolition Waste Control, By-Law on the Incineration of Wastes, Communiqué on Waste Collection Centres, Communique on Refused Derived Fuel, Additional Fuel, and Alternative Raw Material, Compost Communiqué, Communiqué on Mechanical Sorting, Bio drying, Biomethanisation Facilities, and Fermented Products Management. Rehabilitation works have been commenced in compliance with the Circular No. 2003/8 issued by the abrogated Ministry of Environment and Forestry by determining the municipalities for inter-provincial regional cooperation on the issue, locating suitable areas for alternative integrated waste management facilities, and shutting the unorganized (wild) dumpsites down.

Locating suitable areas for the integrated waste management facilities attracts attention as one of the major problems. The presence of a large number of local governments in the same region obliges the cooperation in the waste management services as well as in the other infrastructure services. Model practices of the local administrative unions encouraged by the new legislative regulations take attention as a structure that facilitating the fulfilment of the local environmental services. The practices of the unions established by the municipalities that are subject to similar environmental problems are significant concerning using the time and financial resources efficiently. Within this context, an increase has been observed in the number of waste management projects conducted by the local administrative unions. Moreover, within the scope of regional development policies, the service union models are predicted to be used in solving regional environmental problems. Furthermore, EU-funded regional development projects also recommend establishing service unions.

According to data of 2018, the amount of municipal waste collected in Turkey is 32.2 million tons/year. (TURKSTAT, 2018). Table 66 shows the total amounts of municipal waste by year.

Table 66 - Amount of municipal waste
(TURKSTAT,2019)

Years	Amount of the collected waste (1.000 tons/year)
2003	26,118
2004	25,014
2006	25,280
2008	24,361
2010	25,277
2012	25,845
2014	28,011
2016	31,584
2018	32,209

Today organized landfill sites have been constructed and set into operation rapidly, while the wastes were tipped in unorganized dumpsites in an unregulated way in previous years. Following the transportation of the municipal wastes to the integrated waste management facilities including the organized landfill facilities established in accordance with the related legislation, the relevant municipality should deactivate the unorganized dumpsites and rehabilitate them in compliance with rehabilitation projects. The local administrations still carry on the works related to preparing the rehabilitation projects and conducting the given rehabilitation projects.

According to data from TURKSTAT 2018, the rate of waste disposed of at landfills increased to 67.2% and the rate of recycled ones is 12.3%.

Graph 32 - Number of municipalities provided with the service of landfills and population rate by years

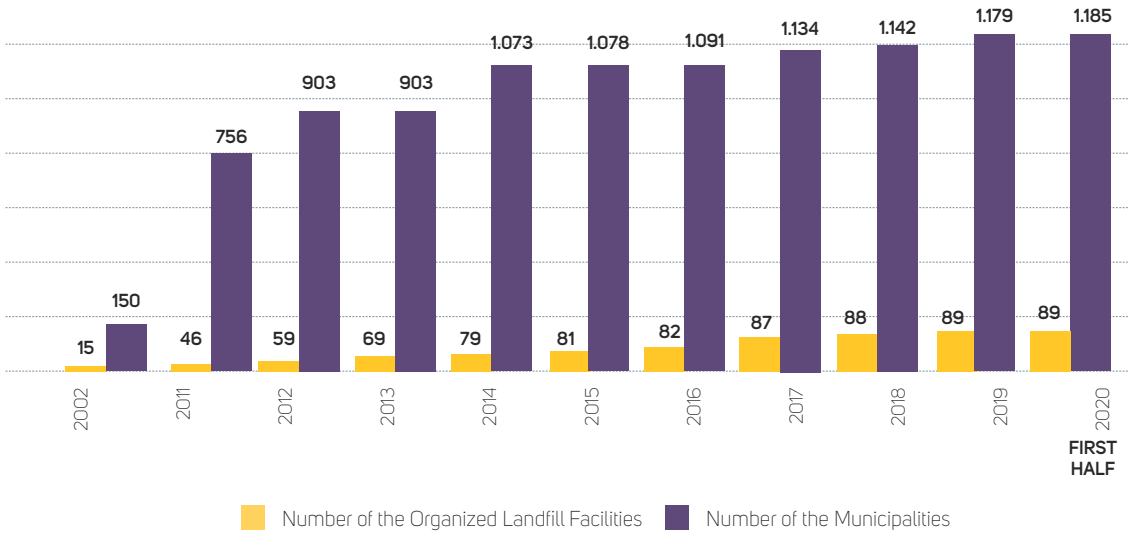
(Ministry of Environment and Urbanization,2020)

	2012	2014	2016	2018	2019	2020 (first half)
Number of municipalities provided with the service of landfills	903	1,073	1,091	1,142	1,179	1,185
The rate of population provided with waste disposal and recycling to the population of the municipalities	69	70	71	74,4	82	82.5

In accordance with Law No. 5491 "Amending the Environmental Law No. 2872", By Law on Waste Management, Law No. 5216 on "Metropolitan Municipalities", and "Municipality Law" No.5393; the Municipality and the municipalities in the municipal adjacent borders and the highest local authorities serve in locality out of the mentioned areas are obliged to ensure the disposal of the household wastes or household type industrial solid wastes before damaging the environment, abate the environmental pollution, utilize maximum from the landfill sites and collect wastes by categorizing the recycle solid wastes among the household solid wastes to make an economic contribution and take measures relevant to these issues.

Graph 33 - The number of the organized landfill facilities, and the municipalities provided with the service by years

(Ministry of Environment and Urbanization,2020)



Integrated waste management is conducted through the new facilities established by the municipalities. In other words; all the wastes, collected separately from different sources and sent to the waste treatment facilities by the municipalities, are disposed of by sending the recyclable ones to the recycle, treating biodegradable ones in treatment facilities, and transferring the ones that cannot be treated to the landfill sites instead of tipping them directly at the landfills.

The Solid Waste Program (SWP) Project was included in the 2017 Investment Program to ensure the metropolitan municipalities and municipalities/unions make waste management investments most economically and appropriately and fulfil their environmental obligations on waste management. SWP comprises all operations and proceedings relevant to preparation and acceptance of the construction works and as-built projects of the integrated waste management facilities, second class landfills, additional lots to the second class landfills, pre-treatment facilities (mechanical sorting or bio drying or refused derived fuel facility) and transfer stations of the metropolitan municipalities and municipalities/unions. 90 million Turkish Liras have been donated to the local administrations since 2018 to ensure they make waste management investments and fulfil their environmental obligations in this sense. The local administration investments will be supported till the end of 2023.

D.2. Excavation Soil and Construction and Demolition Wastes

Considered the legal legislation in Turkey, the task of determining excavation soil and construction and demolition waste dumpsites is entrusted to the metropolitan municipalities pursuant to (i) clause of Article 7 of the Law no. 5216 on Metropolitan Municipalities and to the municipalities pursuant to (o) clause of Article 15 of the Law no. 5393 on Municipalities. Furthermore, the "By-Law on the Control of Excavation Soil and Construction and Demolition Waste" was enacted by being issued in the Official Gazette No. 25406 dated 18 March 2004, and the By-Law sets out the technical issues, administrative matters, and mandatory regulations relevant to primary reduction at the source of excavation soil and construction and demolition wasting so as not to harm the environment then, collection, temporary storage, transportation, recycle, treatment and disposal of those wastes.

Pursuant to Article 12 of the Environmental Law, the mayors would be conferred the power of inspecting and fining in the fields of collecting, temporary storing, transporting, and recycling of the mentioned wastes.

The Ministry of Environment and Urbanization has delegated the authority to inspect the excavation soil wastes and decide on administrative enforcements within the framework of the By-Law on the Control of Excavation Soil and Construction and Demolition Waste to the Metropolitan Municipalities of İstanbul, Kocaeli, Sakarya, Gaziantep, Bursa, Ordu, Ankara, Trabzon, and Antalya pursuant to Article 12 of the Environmental Law.

D.3. Packaging Wastes

The solid waste composition has been changing in Turkey in conjunction with the changing consumption patterns, population growth, rising living standards, and increase in sales of packaged products. In general, the packaging wastes constitute 30% of the wastes by weight and 50% of the wastes by volume.

The change in waste composition has mainly ensued from the increase in packaging waste content such as paper, cardboard, glass, plastic, and metal. Since most products are sold in paper, metal, glass, and plastic packages, the source-separated collection of the wastes and reintroduce them to the economy is an important step in solid waste management.

The necessary legal and technical arrangements were made in Turkey to reduce the environmental pollution caused by packaging wastes, which had an important role among solid wastes, and to make them economic value again. Moreover, the legislation, which had been enacted in a narrower scope since 1991, started to be implemented in 2005 with the harmonization of the Directive 1994/62 / EC of the European Union on Packaging and Packaging Wastes. The legal, administrative, and technical principles for the collection, transportation, separation, and recycling of packaging wastes in a specific management system were prepared by the Ministry of Environment and Urbanization and determined by the By-Law on Control of Packaging Wastes. The By-Law was entered into force on 1/1/2018 after being published in the Official Gazette No. 30283 dated 2017.

The producers, importers, and marketers, those who have been imposed with an obligation within the scope of the responsibility of producers, importers, and marketers, must fulfil their obligations regarding collecting, transportation, recovery, recycling, and disposal of the wastes according to the principle of 'polluter pays' under the provision in Article 11 of the Environment Law No.2872. Since there is an obligation for products placed on the market domestically, these organizations are defined as marketers in the By-Law on Packaging Waste Control (BLPWC). At this point, the costs of the collection, transportation, recovery, recycling and disposal of packaging wastes are covered by the enterprises who released them to the market, in other words, by the brand owners, and the marketers have been obliged to recover at varying rates over the years, in other words, they have been imposed to the certification obligation in line with this provision to fulfil this obligation.

The marketers have been allowed to come together to form a non-profit legal entity to fulfil their obligations more effectively through the By-Law. Under the By-Law, Environmental Protection and Packaging Waste Recovery and Recycling Trust (ÇEVKO) were authorized in 2005 (renewal in 2013), the Consumer and Environmental Education Foundation (TÜKÇEV) was authorized in 2010 (renewal in 2013), the Recycling Economic Entity of the Turkish Plastics Industry Research and Development and Education Foundation (PAGÇEV) was authorized in 2014, and Waste Paper and Recyclers Association (AGED) was authorized in 2015.

Authorized organizations/marketers are obliged to meet the recovery targets of packaging wastes from 2005 to 2018 at least at the rates specified in Table 67.

Table 67 - Recycling Targets of Packaging Waste
(Ministry of Environment and Urbanization, 2020)

Years	Annual recovery targets by material (%)				
	Glass	Plastic	Metal	Paper / Cardboard	Wood
2005	32	32	30	20	-
2006	33	35	33	30	-
2007	35	35	35	35	-
2008	35	35	35	35	-
2009	36	36	36	36	-
2010	37	37	37	37	-
2011	38	38	38	38	-
2012	40	40	40	40	-
2013	42	42	42	42	5
2014	44	44	44	44	5
2015	48	48	48	48	5
2016	52	52	52	52	7
2017	54	54	54	54	9

The authorized organizations and the marketers who apply a deposit/refund system to the market have been ensuring that the material-based recycling targets are achieved at least at the rates given since 2018.

Table 68 - Material Based Recycling Rate (%)
(Ministry of Environment and Urbanization, 2020)

Years	Material-based recycling rate (%) (including preparing to reuse)				
	Glass	Plastic	Metal	Paper / Cardboard	Wood
2018	54	54	54	54	11
2019	54	54	54	54	13
2020 and the following years	60	55	55	60	15

The Ministry of Environment and Urbanization, together with all parties that have obligations in the By-Law on the management of packaging wastes, must take the necessary measures to achieve the total recycling, and recovery targets regardless of the material type, at least at the rates given in Table 69 below.

Table 69 - Total Recycling and Recovery Targets in Packaging Waste Management
(Ministry of Environment and Urbanization, 2020)

Years	Total recovery rate (%)	Total recycling rate (%)
2018	56	54
2019	58	54
For each year between 2020 and 2025 (including 2025)	60	55
For each year between 2026 and 2030 (including 2030)	-	65
2031 and the following years	-	70

However, it must be ensured that the material-based annual recycling rates given in Table 70 shall be reached, not less than the rates determined for 2020 until 01.01.2026, and not less than the rates determined for 2026 until 01.01.2031.

Table 70 - Material-Based Annual Recycling Rates
(Ministry of Environment and Urbanization, 2020)

Years	Material-based recycling rate (%) (including preparing to reuse)				
	Glass	Plastic	Metal	Paper / Cardboard	Wood
Until 2026	70	55	60	75	25
Until 2031	75	55	70	85	30
2031 and the following years	75	55	70	85	30

A healthy and sustainable waste management system requires that recyclable wastes be collected separately at the source without mixing with garbage and the recovery process is carried out in an organized structure. It is possible to protect natural resources, prevent waste of resources and reduce the amount of solid waste that needs to be disposed of through the recycling practice. Furthermore, both the

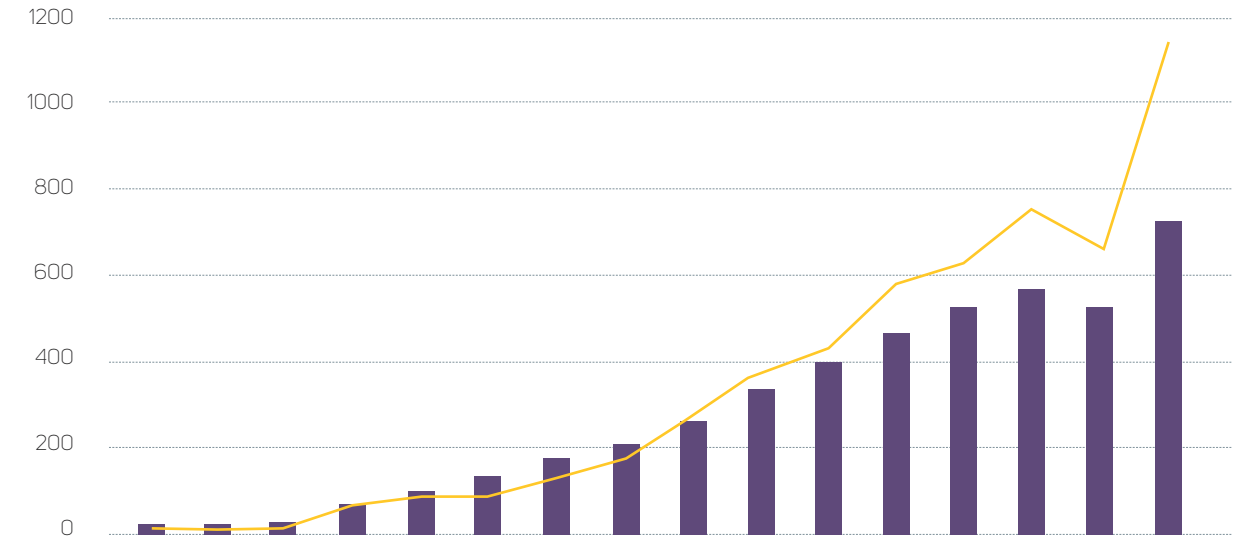
amount of waste going to the landfill can be reduced and the recyclable waste can be introduced into the economy as raw materials. For this purpose, a system has been established for separate collection, considering the separation of packaging wastes at the source as a basis in the By-Law.

Since the municipalities are responsible for the collection of wastes under Metropolitan Municipality Law No.5216 and Municipality Law No.5393, the responsibility of collecting and transporting the packaging wastes separately at the source is given to the municipalities within this system defined in the By-Law.

Separate collection of packaging wastes at their source can be conducted by the municipalities themselves or by the service procurement method. According to the By-Law, it is forbidden to collect, transport, and /or recycle packaging wastes by persons other than licensed businesses. So, if the municipalities want to collect packaging wastes separately at their source, they must establish a facility for the collection and separation of packaging wastes and obtain a license for this facility from the Provincial Directorate of Environment and Urbanization. Municipalities that will prefer the way of service procurement should contact enterprises with temporary authorization certificate /environmental license and carry out separate collection practices together with these enterprises. The real and legal persons who want to recycle packaging wastes must obtain an environmental license from the Provincial Directorates of Environment and Urbanization. The environmental licenses are issued in two forms: collection-separation facility (CPF) licence and recycling facility (RF) license.

Graph 34 - Number of Temporary Authorization Certificate / Licensed Packaging Waste Treatment Facilities

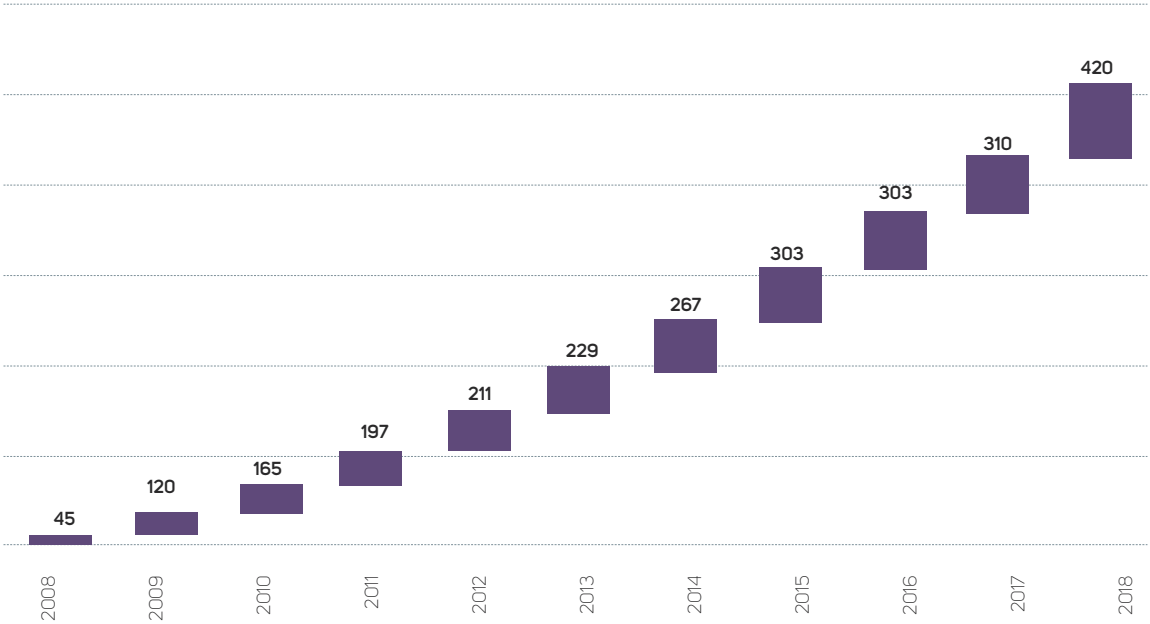
(Ministry of Environment and Urbanization, Packaging and Packaging Waste Bulletin 2018, 2020)



		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
CPF		15	23	31	69	101	137	176	210	266	340	403	465	527	566	527	731
RF		13	14	19	70	81	89	134	170	276	366	433	572	627	751	665	1128

Municipalities are also obliged to prepare a packaging waste management plan that specifies how, when and in what way the packaging waste will be collected. The Packaging Waste Management Plan Formats was first prepared by municipalities and presented to the Ministry in 2008. The number of municipalities whose plans have been approved is given by years in Graph 35.

Graph 35 - Number of Municipalities with Approved Packaging Waste Management Plan (Ministry of Environment and Urbanization, Packaging and Packaging Waste Bulletin 2018, 2020)



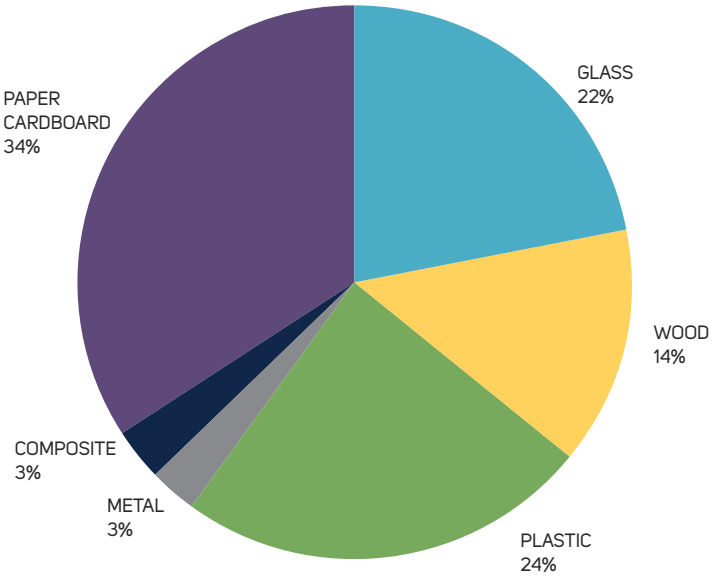
The Municipalities are obliged to collect or have collected the packaging wastes according to the By-Law. They prepare the packaging waste management plans, indicating by whom, how, in what way, and when the packaging waste will be accumulated, collected, and transported separately from other wastes at the source, and present to the Ministry to carry out these practices. The practices initially started in 2008 and continue.

The packaging wastes collected and separated are sent to recycling facilities and they are reintroduced to the economy.

Table 71 - 2018 Statistical Results on Packaging and Packaging Wastes
(Ministry of Environment and Urbanization, Packaging and Packaging Waste Bulletin 2018, 2020)

Waste Code	Type	Produced Packaging (ton)	Within the scope of B-1 [7]K			Released to the market within the scope of B-2[8] (ton)	Supplied within the scope of C[9] (ton)
			Released to the Market (Ton)	Recovered (ton)	Recovery Rate (%)		
15.01.02	**PLASTIC**	4,099,951	943,567	590,923	63	98,240	20,317
15.01.04	**METAL**	179,438	130,981	89,488	68	82,284	6,307
15.01.05	**COMPOSITE**	102,636	96,773	62,110	64	21,629	0
15.01.01	**PAPER CARDBOARD**	2,529,403	1,314,154	1,227,249	93	17,164	11,805
15.01.07	**GLASS**	955,721	860,239	234,699	27	40,021	120,063
15.01.03	**WOOD**	1,070,084	547,681	171,048	31	4,952	85,935
	TOTAL	8,937,232	3,893,396	2,375,518	61	264,289	244,427

Graph 36 - The Rates of Packages Released to the Market under B-1 in 2018
(Ministry of Environment and Urbanization, Packaging and Packaging Waste Bulletin 2018, 2020)



All data such as packaging production, sales, and recycling amounts from packaging producers, packaged products marketers, and licensed enterprises have been recorded by the Ministry of Environment and Urbanization since 2005.

Furthermore, the data on packaging and packaging wastes have been officially published in February as annual bulletins since 2008.

7 B-1: Packages disposed within the framework of BLPWC
8 B-2: B-2: Packages disposed within the framework of legislation apart from BLPWC
9 C: Packages placed on the market with a deposit within the scope of BLPWC

D.4. Hazardous Wastes

According to the Environmental Law, the wastes that cause physically, chemically, and/or biologically negative effects and cause the degradation of the ecological balance and natural structures of humans and other living things, and substances contaminated with these wastes are called hazardous waste.

Hazardous wastes refer to wastes having one or more of the hazardous characteristics included in Annex-3/A of the By-Law on Waste Management (BLWM) and with an asterisk (*) sign next to the six-digit waste code in Annex-4 of the By Law on Waste Management (BLWM).

Measures that do not harm human and environmental health should be taken while ensuring the recovery and disposal of these wastes. For this reason, the facilities that make hazardous waste recovery and disposal are required to obtain a license from the Ministry of Environment and Urbanization. Moreover, the companies transporting hazardous wastes are also required to obtain a hazardous waste transportation license.

Data on hazardous waste consists of the declarations made by the waste producers to the Hazardous Waste Declaration System (HWDS) of the Ministry of Environment and Urbanization and includes data relevant to the hazardous waste generated at the facility in the declaration year and sent to the waste treatment facility for recovery/disposal purposes.

Table 72 - Number of Facilities and Hazardous Waste Amounts Declared to the Hazardous Waste Declaration System between 2015-2018

(Ministry of Environment and Urbanization, HWDS, 2020)

	2015	2016	2017	2018
The Number of the Facilities Declared	44,992	60,233	63,741	66,478
Total Amount of Hazardous Waste * (ton)	1,357,340	1,363,227	1,425,045	1,513,624

*mining sector waste not included in the total.

Table 73 – Amount of Hazardous Waste(Ton) according to the Waste Treatment Method[10] between 2015-2018

(Ministry of Environment and Urbanization,HWDS, 2020)

Year	Recovery	Disposal	Stock	Export	Total
2015	1,129,088	167,222	53,251	7,779	1,357,340
2016	1,089,809	222,263	40,933	10,222	1,363,227
2017	1,190,764	209,930	13,673	10,678	1,425,045
2018	1,286,363	200,767	17,434	9,060	1,513,624

10 Recovery: refers to the amount of hazardous waste sent from the facility to be subjected to one of the recovery methods specified in the By Law on Waste Management,

Disposal: refers to the amount of hazardous waste sent from the facility to be subject to one of the disposal methods specified in By Law on Waste Management,

Stock: refers to the amount of hazardous waste stocked in the facility as of the end of the year,

Export: refers to the amount of hazardous waste sent from the facility with the export registry.

Map 17 - Map of Hazardous Waste Amount Distribution by City in 2018
(Ministry of Environment and Urbanization, HWDS, 2020)

D.5. Waste Mineral Oils

The procedures and principles regarding the protection of the environment and human health and the efficient use of natural resources, under determining the technical and administrative principles regarding ensuring the temporary storage, collection, transportation, refining, energy recovery, and disposal processes of waste oils, were specified by the By-Law on Waste Oil Management No. 30985 dated 21/12/2019. The By-Law on Control of Waste Oils published in the Official Gazette No. 26952 dated 30/7/2008 was abolished after the By-Law on Waste Oil Management entered into force on 1/1/2020.

Establishment of high-efficiency waste oil refining facilities from waste oils where high-value added products can be obtained concerning base oil production, improvement of the current facilities, increasing waste oil collection rates, complying with the legislation and more efficient management of the waste oil is aimed with the published By-Law.

Moreover, fuel stations, repair shops, services, public institutions/organizations, municipalities, mining enterprises, and other enterprises where engine oil change is conducted will be recorded and certified.

Table 74 - The Total Amount of Waste Mineral Oil between 2015-2018 (Ton)
(Ministry of Environment and Urbanization,HWDS, 2020)

	2015	2016	2017	2018
Total Amount of Waste Mineral Oil (ton)	60,906	68,895	66,442	70,130

D.6. Waste Batteries and Accumulators

The principles regarding the management of waste batteries in our country are specified by the "By-Law on Control of Waste Batteries and Accumulators" prepared by the Ministry of Environment and Urbanization and entered into force on 01 January 2005 after being published in the Official Gazette No. 25569 dated 31 August 2004.

The By-Law aimed, to minimize the damages of waste batteries and accumulators to the environment and human health, not to allow their disposal together with the domestic wastes in municipal solid waste landfills, to establish a collection system for recovery or final disposal of them and to create a waste management plan.

Regarding waste batteries; it is important to carry out the collection of waste batteries more efficiently by increasing the number of collected batteries via developing an effective battery collection system in our country and to recycle the collected batteries rather than to dispose of them by burying them.

Batteries are not produced in our country. Battery importers are obliged to ensure the collection and recycling/disposal of waste batteries in the following year quota rates based on the number of batteries imported and released to the domestic market one year ago.

The basic raw materials of batteries used in automobiles are lead, lead compounds, plastic materials, and acidic solutions.

Lead compounds and acidic solutions generated from the waste accumulators, which have expired after a long time of use and become waste, can harm both human health and the environment if they are not properly disposed of. For this reason, waste batteries need to be collected in licensed vehicles, stored permanently or temporarily, and recycled in licensed facilities.

Approximately 60% of a waste accumulator can be recycled as the lead. Most of the need for the lead in our country can be met thanks to the recycling of waste accumulators.

Accumulator producers/importers are obliged to collect and recycle/dispose of the used accumulators, of which they produced or introduced to the market, within the scope of the Deposit Application under the extended producer responsibility.

D.7. Waste Vegetable Oils

Vegetable waste oils have been specified as used frying oils and other oils (for example, expired oils) and included in the By-Law with the publication of the By-Law on Control of Waste Vegetable Oils in the Official Gazette No. 29378 dated 06.06.2015.

The vegetable waste oils must be collected by vegetable waste oil recovery facilities and vegetable waste oil interim storage facilities and used only in biodiesel or biogas production in facilities with an environmental license in conformity with the technical regulations under the By-Law.

Table 75 - The Total Amount of Waste Vegetable Oil Between 2015-2018 (Ton)
(Ministry of Environment and Urbanization, HWDS, 2020)

	2015	2016	2017	2018
Total Amount of Waste Vegetable Oil (ton)	12,958	17,070	16,043	13,170

D.8. Polychlorinated Biphenyl's and Polychlorinated

Activities for the disposal and purification of PCB-containing equipment are carried out within the scope of the POPs (Persistent Organic Pollutants) Legacy Elimination and POPs Release Reduction Project under the Ministry of Environment and Urbanization.

D.9. End-of-Life Tires

The principles regarding the management of End-of-Life Tires (ELTs) are specified under the By-Law on the Control of End-of-Life Tires published in the Official Gazette No. 26357 dated 25.11.2006 and entered into force on 01.01.2007.

It is important for the environment and human health not to deliver the End-of-Life Tires directly to the receiving environment in a way that will harm the environment and to establish a management plan.

ELTs can be a suitable breeding ground for mosquitoes and mice when they are thrown, released, or deposited into nature, and also play an active role in the spread of epidemics. End-of-Life tire piles might be the cause of fires that cannot be extinguished for days. With these fires, tons of toxic gases such as dioxin-furan are emitted into the atmosphere in the form of a black cloud. These pollutants spreading to the atmosphere not only threaten human health directly but also cause pollution of the soil and water in the vicinity.

Within the scope of the 17th article of the By-Law on the collection of the ELTs;

The tire producers and importers have been imposed to collect the ELTs within the framework of the producer responsibility under the provision of "The Ministry obliges the application of quotas within the scope of the producer responsibility to ensure the environmentally compatible management of ELTs."

Tire manufacturers and importers are obliged to withdraw the End-of-Life tires from the market at the quota determined by the Ministry over the number of products they have introduced in the previous year. In this context, 80% quota has been applied to the tire manufacturers since 2014.

The producers/importers operate to carry out the waste collection activities, they are obliged to within the scope of the By-Law, individually or as a member of the authorized organization under Article 11 of the Environmental Law. In this context, there is one authorized organization related to tires in our country. The authorized institution carries out the collection activity to meet the quota rates within the waste management plan created, and the amount of ELTs collected throughout the country is recorded by the Ministry.

Efforts are in progress for conducting the waste management more efficiently by paying attention to recycling end-of-life tires. The polluting gases that spread to the atmosphere and directly threaten human health and pollution of soil and water will be prevented by increasing the collection rate of end-of-life tires.

Table 76 - End-of-Life Tires Collected Between 2015-2018 (Tons)
(Ministry of Environment and Urbanization, HWDS, 2020)

	2015	2016	2017	2018
End-of-Life Tires (ton)	15,307	18,406	21,450	27,269

There have been a total of 30 end-of-life tire recovery facilities in our country since September 2020.

D.10. Waste Electrical and Electronic Equipment

By-Law on the Waste Electric and Electronic Equipment (WEEE) entered into force after being published in the Official Gazette No. 28300 dated 22.05.2012 so that the electrical and electronic equipment (EEE) can be managed in an environmentally friendly manner during the process from production to final disposal.

EEE producers/importers have collection obligations regarding the collection of the domestic EEEs, they introduced to the market, after they become waste.

Table 77 – The Total Amount of Waste Electrical and Electronic Equipment Between 2015-2018

(Ministry of Environment and Urbanization, HWDS, 2020)

	2015	2016	2017	2018
Total Waste Electrical and Electronic Equipment (ton)	11,596	23,027	19,224	23,365

Moreover, the EEE sector is registered by the Ministry of Environment and Urbanization within the scope of the said By-Law, and accordingly, the By-Law is implemented more effectively by the sector.

D.11. End-of-Life Vehicles

The Directive on End-of-Life Vehicle 2000/53/EC dated September 18, 2000, determining the management strategy of end-of-life vehicles of the European Union, in which we are in the process of membership, is included in the "directives to be harmonized first" in the Turkish National Program for the Adoption of the EU Acquis.

Prevention of the generation of wastes from vehicles to protect the environment and human health and, reducing the amount of waste to be disposed of by reuse, recycling, and recovery of end-of-life vehicles and their parts are aimed within the scope of harmonization of the said directive with our national legislation.

"By-Law on Control of End-of-Life Vehicles" was prepared and published on 30.12.2009 within the scope of the efforts to harmonize the Directive on End-of-Life Vehicle 2000/53/EC dated September 18, 2000, with our national legislation. The By-Law includes M1 (motor vehicles with a maximum of 8 seats other than the driver, motor vehicles for passenger transport), N1 (motorized freight transport vehicles with a maximum mass not exceeding 3,500 kg), three-wheeled vehicles other than motorcycles and motor bicycles, and their parts.

There are 513 delivery points with permission and 117 temporary storage facilities with provisional operation certificate (POC) and permission-license from the Ministry as of October 2020 in Turkey according to the 2020 data of the Ministry of Environment and Urbanization. End-of-life vehicles are delivered to licensed facilities and are recorded through the End-of-Life Vehicles Disposal Tracking System. The number of vehicles registered to be scrapped through End-of-Life Vehicles Disposal Tracking System is 8,033 for 2012, 10,593 for 2013, 11,953 for 2014, 14,728 for 2015, 15,516 for 2016, 14,599 for 2017, 150,625 for 2018 and 295,709 for 2019, respectively. Considering the numbers, the effects of the SCT reduction scrappage incentive program applied between 27.03.2018 and 31.12.2019 can be easily seen (Graph 37 and Table 78).

Graph 37 - Number of End-Of-Life Vehicles Treated and Their Total Weights
(Ministry of Environment and Urbanization, 2020)

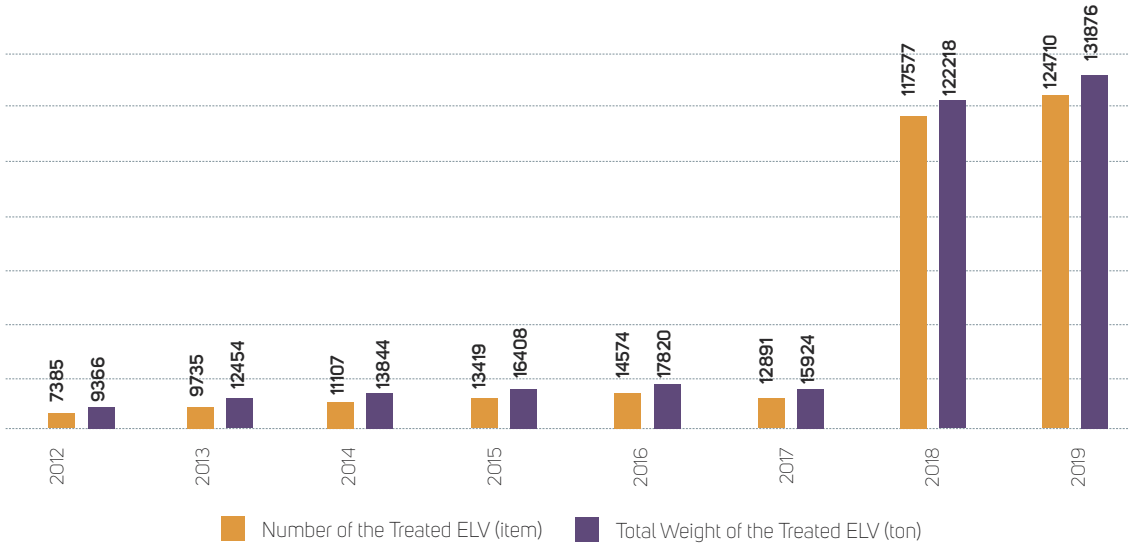


Table 78 - Number of Vehicles Registered for Scrapping on the End-of-Life Vehicle Disposal Tracking System and Scrapped by the Registrar
(Ministry of Environment and Urbanization, 2020, General Directorate of Security, 2019)

YEARS	2012	2013	2014	2015	2016	2017	2018	2019
a. Total number of motor vehicles in traffic	17,033,413	17,939,447	18,828,721	19,994,472	21,090,424	22,218,945	22,865,921	23,156,975
b. Total number of vehicles deregistered from traffic	125,407	225,356	153,054	106,838	118,658	118,928	256,298	NO DATA
c. The number of vehicles registered through the ELV System (M1 and N1 categories)	8,033	10,593	11,953	14,728	15,516	14,599	150,625	295,709
d. Number of ELV treated	7,385	9,735	11,107	13,419	14,574	12,891	117,577	124,710
e. Total weight of ELV treated (tons)	9,366	12,454	13,844	16,408	17,820	15,924	122,218	131,876

D.12. Non-Hazardous Wastes

Table 79 – The Amount of Non-Hazardous Waste between 2016 - 2018 (*) (Ton)
(Waste Management Application, HWDS, 2020)

Year	Recovery	Disposal	Stock	Export	Total (Ton)
2016	13,843,431	1,630,881	2,253,878	149,259	17,877,448
2017	9,595,038	2,965,927	2,463,138	100,848	15,124,951
2018	9,749,190	3,211,222	1,899,421	208,800	15,068,633

(*) According to the Waste Treatment Method

D.12.1. Iron and Steel Industry and Slag Wastes

8.2 million tons of 11.2 million tons of iron and steel industry wastes are combustion wastes according to the results of the 2018 survey of manufacturing industry water, wastewater, and waste statistics conducted by TURKSTAT. Waste from combustion includes the amount of ash and slag from thermal reclamation and combustion processes and wastes from flue gas treatment.

Combustion Wastes are listed in the European Waste Classification for Statistics with the code 12.4. 91.6% of 8.2 million tons of combustion waste have been recovered.

D.12.2. Coal- Burning Thermal Power Facilities and Ash

A total of 23,315,821 tons of slag and fly ash were generated from 23 thermal power facilities using coal as fuel in 2018 according to the results of the 2018 survey of thermal power facility water, wastewater, and waste statistics conducted by TURKSTAT.

D.13. Medical Wastes

The principles regarding the safe management of medical wastes in our country have been specified by the By Law on Medical Waste Control published in the Official Gazette No. 29959, dated 25.01.2017, and infectious wastes, pathological wastes, and cutting-piercing wastes are defined as medical wastes in the By-Law. Since medical wastes carry a higher risk of infection than other types of wastes, many microorganisms can be transmitted through medical wastes. Therefore, inadequate and improper management of medical wastes can pose serious risks to public health as well as adverse effects on the environment. For this reason, safe medical waste management is an important issue in protecting human health and the environment.

In this context, it is forbidden to accept medical wastes that have not been pre-processed into landfills, and medical wastes must be disposed of by burning or sterilized and rendered harmless according to the By-Law.

All medical waste amounts declared to the Ministry of Environment and Urbanization HWDS in 2015 and 2016 are given in Table 80.

Table 80 – All Medical Waste Amounts Declared to the Ministry of Environment and Urbanization HWDS

(Ministry of Environment and Urbanization- HWDS, 2020)

	2015	2016
Total Medical Waste (Ton)	113,857	98,376

Medical waste statistics have been formed through the declarations to the Hazardous Waste Declaration System (HWDS) within the context of the study conducted annually between The Ministry of Environment and Urbanization and Turkey Statistical Institute since 2017 and the joint logo of the two institutions is published in the bulletin.

The amount of medical waste given in the Table 81 includes the data of the health institutions (universities, maternity and general-purpose hospitals and clinics) that declared to the Ministry of Environment and Urbanization HWDS.

Table 81 – The Amount of Medical Waste (Ton) in 2017 - 2018

(Ministry of Environment and Urbanization- HWDS, TURKSTAT, 2019)

	2017	2018
Number of health institutions	1,525	1,550
Medical waste amount (tons)	85,987	89,454
Disposed in incineration facilities (ton)	7,607(r)	6,895

(r) Revised

(TURKSTAT, Medical Waste Bulletins, 2016 and 2018)

Services are provided with a total of 64 medical waste sterilization facilities as of September 2020 in Turkey. Moreover, there are 3 incineration facilities where medical wastes are disposed of.

Graph 38 – Distribution of Medical Waste Disposal Facilities in Turkey by City

(Ministry of Environment and Urbanization, 2020)

D.14. Alternative Raw Material

It can be evaluated as an alternative raw material, formed as a result of the activity of a facility and equivalent to the raw material in terms of mineral properties, and natural resources are protected by using mineral waste instead of natural raw materials.

The wastes containing silica, aluminium, iron oxide, and/or calcium oxide such as construction wastes, treatment sludge, mine wastes are used as a substitute for natural resources by facilities producing cement, concrete, lime, brick, tile, ceramic, and iron, and steel as alternative raw materials. In this way, they are recycled to the economy and managed effectively by being reused or recycled as much as possible in accordance with the waste hierarchy instead of being sent to generated wastes to the disposal facilities. At the same time, waste disposal costs are reduced, the amount of waste sent to landfill is reduced, and the useful life of regular storage landfills is extended.

The facilities that will use the wastes, generated as a result of the activities of a facility, as alternative raw materials are obliged to obtain approval from the Ministry of Environment and Urbanization by applying with the necessary information and documents, but are exempted from the application of an environmental license.

The alternative raw material usage approvals were given for 67 codes in the cement sector, 5 codes in the brick sector, 1 code in the glass sector, 2 codes in the concrete sector, and 1 code in the lime sector in line with the "Waste Recovery" awareness of our industrialists.

D.15. Waste Reduction Practices

Wastes can be recycled where they are produced, provided that methods and processes that are used do not pose a risk to water, air, soil, plants, animals, and people, not cause any discomfort through the noise, vibration, and odour, prevent adverse effects on the natural environment and thus not harm the environment and human health. The Ministry of Environment and Urbanization is authorized to exempt the facilities that recycle their wastes at the place they are produced, excluding energy recovery, from the environmental license application. The facilities exempted from environmental license application by the Ministry are required to provide information on the amount and type in the waste management plan, make the necessary notifications through the Environmental Information System and comply with the provisions of the legislation on waste management. The application is made to the Ministry for environmental license exemption and the Ministry makes an assessment on waste and facility basis.

D.16. By Product

The substances or materials generated in the production process but the main purpose is not the production of this substance can be considered as a by-product, not as waste if;

- it is produced as an inseparable part of the production process and is included as a product / by-product in the capacity report,
- the demand for its future use is continuous,
- it can be used in a direct process and does not undergo any other processes except for the physical ones it is produced,

- it is documented that the product to be substituted complies with the standards or that the final product does not ruin the product's standard in case used as raw material,
- measures that do not harm the environment and human health are taken in its use.

8 different types of wastes from 26 facilities were approved to be used as by-products as of the end of 2019.

D.17. Mining Waste

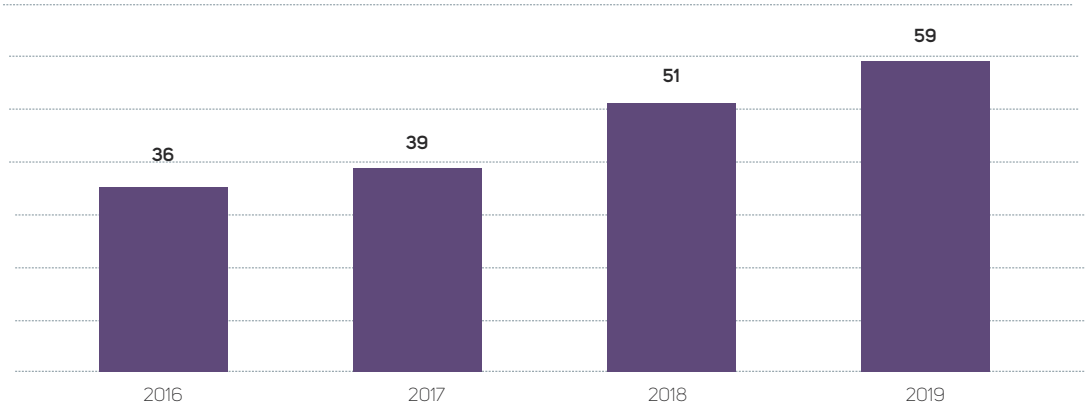
While significant amounts of wastes with different characteristics are generated at all stages of mining, these are among the wastes with the highest potential of water, soil, and air pollution. Mining wastes differ from other waste groups in terms of their management features since they are released in very high amounts, the difficulties experienced in obtaining the disposal place for them, and the complex structure that arises due to the physical and chemical properties of the waste.

Picture 1 - Mine Waste Storage Facility

The By-Law on Mining Waste, including a kind of management that is suitable for the realities of our country, compliant with the European Union Directives and, specific to only mining sector wastes, was published in the Official Gazette No. 29417 dated 15 July 2015 and entered into force on 15 July 2017. Issues such as characterization of mine wastes and classification of disposal facilities, recycling, waste management plan, and emergency action plan, permit and license process, environmental monitoring, temporary storage, inert waste management, drilling muds, disposal in marine receiving environment, heap leaching method, paste filling, tailing waste management and waste management have been clarified under the By-Law. Mining activities are carried out in wide areas due to their nature, and drilling wastes, tailing wastes, and enrichment wastes are generated respectively during the stages of exploration, extraction, and processing.

Process wastes generated during mineral processing activities and tailing waste, which has the potential for acid production because of being generated from mine excavations/extraction, are stored in mine waste disposal facilities licensed by the Ministry of Environment and Urbanization. Mining waste storage facilities are monitored by the Ministry of Environment and Urbanization from the beginning to the end of the construction works, and the "Mine Waste Storage Facility" approval certificate is provided to the facilities of which constructions are identified to be completed in accordance with the legislation. As seen in the Graph, 59 facilities have been granted the "Mine Waste Storage Facility" approval certificate as of 2019.

Graph 39 - Number of facilities with Mine Waste Storage Facility Approval Certificate (Ministry of Environment and Urbanization, 2020)



According to the results of the 2018 survey of mining enterprises water, wastewater, and waste statistics conducted by TURKSTAT; 812 million tons of wastes (811 million tons in 2016) were generated in mining enterprises in 2018. Mineral waste comprised 99.9% of 812 million tons of wastes generated in mining operations in 2018. The amount of stripping material/tailing waste was determined as 795 million tons (802 million tons in 2016), and the total amount of hazardous waste was determined as 11.177 thousand tons in 2018.

Table 82 - 2016-2018 Water, Wastewater, and Waste Statistics of Mining Enterprises (TURKSTAT, 2020)

	2016	2018
Number of mining establishments (active mines)	3,810	3,865
Amount of water drawn (thousand m³)	240,974	248,889
Amount of wastewater discharged (thousand m³)	141,700 (r)	160,518
Amount of wastewater treated in wastewater treatment plants (thousand m³)	10,646 (r)	13,570
The Total amount of waste (thousand tons)	811,056	812,098
The Total amount of hazardous waste (thousand tons)	C	11,177
Amount of hazardous mineral waste (thousand tons)	C	11,164
The Total amount of non-hazardous waste (thousand tons)	C	800,922
Amount of non-hazardous mineral waste (thousand tons)	805,845	800,374
Amount of pickling material / tailing waste (thousand tons)	801,864	794,711

The numbers in the table may not give the total number due to rounding.

C Confidential data

(r) Revised

71.2% of the total wastes were disposed of in tailings waste areas, waste dams, or regular storage landfills, 26.2% of them were backfilled into the quarry, and 2.6% of them were recovered or disposed of by other methods.

D.18. Zero Waste

The Zero Waste Project was initiated by the Ministry of Environment and Urbanization in 2017 to control our wastes within the framework of sustainable development principles and to leave a clean and developed Turkey and a liveable world to future generations.

Increasing the recovery rate of at least 35% is targeted by 2023 with the expansion of the project nationwide. Moreover, reaching this rate of 60% by 2030 and reducing the amount of stored waste is also aimed.

The By-Law on Zero Waste was prepared under the zero waste project to enable nationwide adoption, implementation, and expansion of the zero waste approach by specifying the general principles for the establishment of the zero waste management system and its implementation procedures and entered into force after being published in the Official Gazette No. 30829 dated 12/7/2019.

The transition periods of local administrations and buildings and campuses to the zero waste management system have been arranged under the By-Law on Zero Waste, the transition of public institutions and organizations to the zero waste management system is expected to be completed by June 1, 2020. It is envisaged that the transition to the zero waste management system in 88 district municipalities in 25 metropolitan cities will be completed as of December 31, 2020, and thus approximately 39 million people will have benefited from the zero waste management system. However, it is necessary to complete the transition to the system in large-scale locations such as organized industrial zones, airports, ports, and shopping centres by December 31, 2020.

Our Ministry prepared the following guidelines, within the scope of the By-Law on Zero Waste, to specify the design and planning criteria, assessment elements, and implementation principles in terms of the administrative, financial and technical elements of the zero waste management system and to organize and guide the efforts regarding the development, improvement, and expansion of the system.

1. Municipal Guidelines
2. Organized Industrial Zones, Industrial Facilities Guidelines
3. Airport, Terminal Guidelines
4. Shopping Mall, Business Centre, Commercial Enterprise, and Plaza Guidelines
5. Educational Institution and Dormitories Guidelines
6. Healthcare Organizations Guidelines
7. Tourism Facilities Guidelines
8. Rural Places Guidelines
9. Institutional Establishment Guidelines
10. Household and Site Guidelines

Users enter data into the Zero Waste Information System developed by the Ministry of Environment and Urbanization to monitor and make an inventory of the activities carried out by those who are obliged to establish a zero-waste management system within the scope of Annex-1 of the By-Law on Zero Waste and those who want to establish the system voluntarily.

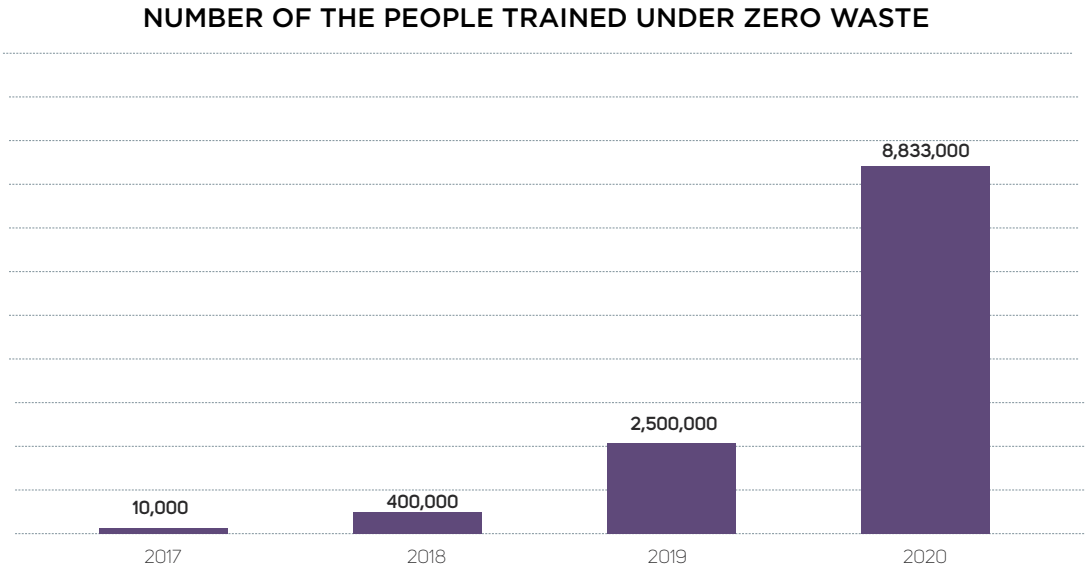
However, applications for the Zero Waste Certificate and the approval process are carried out through the Zero Waste Information System.

2 institutions (Presidency and Ministry of Environment and Urbanization) started to use the zero waste management system in their service buildings in 2017 and then 13,000, 27,000 and, 47,750 organizations/institutions started to use the system in their service buildings in 2018, 2019, and 2020, respectively within the scope of the Zero Waste Project which has been carried out since in 2017.

Graph 40 – Number of Institutions / Organizations Transitioned to Zero Waste System (Ministry of Environment and Urbanization, 2020)

Our training and awareness efforts continue to increase social awareness within the scope of the Zero Waste Project and training was provided to 10,000 people in 2017, 400,000 people in 2018, 2,500,000 people in 2019, and 8,833,000 people in 2020.

Graph 41 - Number of the People Trained under Zero Waste
(Ministry of Environment and Urbanization, 2020)



The most important factors that will lead the zero waste project to success are the adoption of the project by the local governors and it's being carried into execution by them without any delay. 7 regional zero waste consultation seminars have been held until the end of 2019 to inform the employees of our municipalities and provincial directorates, to share good practices with them, to guide them on the zero waste implementation, and to find regional solutions to problems.

The International Zero Waste Summit organized within the scope of the "Zero Waste Project" was held on 1 November 2018 and 1 November 2019.

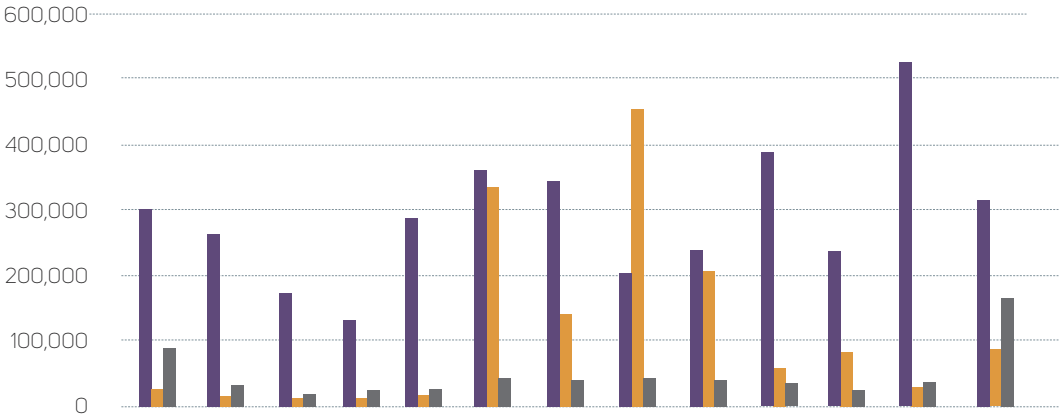
The action of "Supporting R&D projects for the recycling of wastes to achieve the zero-waste target" has been initiated under the responsibility of the General Directorate of Agricultural Research and Policies in line with the policies and measures specified in the 11th Development Plan and the decisions taken in the Agricultural Council. Ensuring the recycling of agricultural vegetable and animal wastes into the soil for achieving the Zero Waste target is highly important to increase the level of organic matter, which is low in the country's soils, and to utilize our local resources.

D.19. Wastes from Ships

Waste receiving facilities have been established and operated to prevent discharge and dumping of wastes from ships and cargo wastes within maritime jurisdiction into the marine environment and protect the marine environment in line with national legislation and the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) acceded by Turkey.

While the number of licensed waste receiving facilities providing ship waste collection service at the port was 18 in 2005, waste collection services have been provided to ships through 163 waste reception facilities in 305 coastal facilities as of September 2020.

Graph 42 - Distribution of Wastes from Ships by Years (m^3) *
(Ministry of Environment and Urbanization, 2020)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Petrol and Petrol Derivatives (m^3)	299,960	264,954	173,571	129,483	286,712	359,505	343,585	203,041	240,046	388,311	236,004	524,031	315,325
Contaminated Water (m^3)	25,481	15,934	12,777	11,947	17,583	335,530	141,695	453,718	206,429	58,950	81,585	27,331	85,413
Garbage (m^3)	88,038	29,950	18,653	23,977	25,255	43,177	41,039	44,007	40,067	33,872	24,514	37,494	163,989

Petrol and Petrol Derivatives (m^3) Contaminated Water (m^3) Garbage (m^3)

*The data for 2020 will be completed at the end of the year.

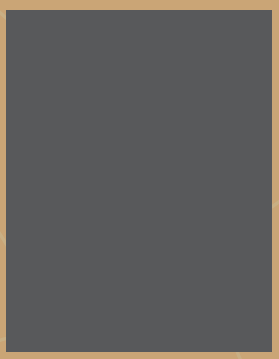
Resources

Ministry of Environment and Urbanization

Turkish Statistical Institute

Ministry of Agriculture and Forestry

E. MANAGEMENT OF CHEMICALS



E. MANAGEMENT OF CHEMICALS

E.1. Classification, Packaging, and Labelling of Chemicals

It is highly important to classify the chemicals by specifying the hazard properties of them and to inform the user about possible adverse effects and safety warnings for ensuring the safe use of chemicals.

The European Commission adopted the By-Law on Classification, Labelling and Packaging of Substances and Mixtures No.1272 / 2008 / EC on 31 December 2008 for aligning the United Nations' GHS (Globally Harmonized System) criteria for classification and labelling to meet the global classification, labelling and packaging criteria By-Law on CLP.

By-Law on CLP was transferred to the legislation with the "By-Law on Classification, Labelling and Packaging of Substances and Mixtures" (By-Law on CLP) published in the Repeated Official Gazette No. 28848 dated 11 December 2013. Revision studies to harmonize the By-Law on CLP with the updates in the EU are ongoing.

The By-Law aims to ensure the common hazard communication about chemicals and the safe use of chemicals, to reduce the costs required to eliminate the health problems and environmental pollution caused by the hazards of chemicals, to minimize the accidents caused by chemicals, and to prevent the technical obstacles encountered in the trade.

Manufacturers and importers of the chemicals send the classification and labelling notifications of the chemicals they manufacture and import within the scope of the CLP By-Law to the Chemical Registration System (CRS) under the Integrated Environmental Information System. 46,279 notifications for approximately 13,069 chemicals have been sent to CRS until July 2020.

E.2. Legislative Regulations and Developments about Management of Chemicals

International Conventions (Stockholm, Rotterdam and, Minamata Conventions) and European Union legislation (REACH, CLP, POPs, and PIC Regulations) are followed and studies are carried out for their transposition into country legislation.

Another important step in the management of chemicals is the establishment of a comprehensive inventory of them. The By-Law on the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH Regulation), which harmonizes the EU REACH Regulation No. 1907/2006/EC (REACH Regulation) was published in the repeated Official Gazette No. 30105 dated 23.06.2017 in line with this purpose.

The registration process for the pure and mixture substances together with the substances that cause the deliberate release or are of high importance in the goods will start in 2021 within the scope of REACH Regulation. Industrial organizations and companies are preparing for this upcoming new registration period.

Among the chemicals in our country's market, those that pose a risk to human health and the environment and whose risks cannot be controlled will be determined by evaluating the registration files. As it is known, these substances, which have carcinogenic, mutagenic, toxic to the reproductive system, persistent in nature, and bioaccumulative and endocrine-disrupting properties, are of high importance for human health and the environment. Risk assessment and socio-economic analysis studies will be carried out on chemicals posing a threat to our environment, and road maps will be determined to protect maximum from the effects of the chemicals within the framework of sustainable development principles. Risk management measures such as the existing permits, restrictions, and prohibitions will be expanded to include the chemicals in question within the context of these studies.

Permission or restriction/prohibition studies are carried out regarding the use of some chemicals that are dangerous for human health and the environment. In this context, direct sales of the cyanide compounds are also prohibited under the "By-Law Amending the By-Law on Registration, Evaluation, Authorization, and Restriction of Chemicals" published in the Official Gazette No. 30963 dated 29 November 2019.

The "Technical Assistance to Conduct Chemical Safety Assessments under the scope of REACH Regulation Project", planned to continue for 2 years for increasing the capacity of industrialists in preparing chemical safety reports and updating and improving the Chemical Registration System, was initiated on 1 November 2019.

28 Chemical Assessment Expert (CAE) Training Institutions and 4 CAE Certification Bodies have been approved by the Ministry of Environment and Urbanization to train CAEs who will prepare registration files and Chemical Safety Reports of substances manufactured/imported in the quantity of 1 ton and more per year.

The technical and administrative procedures and principles for preparing the "Safety Data Sheets", required for the safe use of chemicals, within the framework of the By-Law and for providing them to the professional user were specified in the "By-Law on Safety Data Sheets Regarding Hazardous Substances and Mixtures" published in the Official Gazette No. 29204 dated 13.12.2014.

By-Law On Test Methods Applied for Determining the Physicochemical Toxicological and Ecotoxicological Properties of the Substances and Mixtures, published in the Official Gazette No. 28848 dated 11/12/2013,

specified the test procedures and principles for conducting the Physico-Chemical, Toxicological and Ecotoxicological analyses of the chemical substances and mixtures at international standards.

On the other hand, taking measures to reduce or eliminate the stocks and releases of persistent organic pollutants is among the obligations to be fulfilled by our country within the scope of "The Stockholm Convention on Persistent Organic Pollutants (POPs)", to which our country acceded in 2010. Studies regarding the preparation and updating of the National Implementation Plan, the creation of persistent organic pollutant inventories, taking measures and conducting monitoring activities to reduce their stocks and releases, and reporting to the Convention secretariat at regular intervals are ongoing to fulfil the obligations of the contract.

"POPs Legacy Elimination and POPs Release Reduction Project" was initiated on 17 December 2015 in cooperation with the United Nations Development Program (UNDP) and the United Nations Development and Industry Organization (UNIDO) with the large-scale project support from the Global Environment Fund (GEF) for POPs Legacy Elimination and POPs Release Reduction and it is expected to be completed in 2020. It is aimed, with the project in question, to eliminate existing POPs stocks, to provide a long term capacity for managing POPs in line with international practices and standards in the future, and to integrate POPs activities into national chemical management principles.

The Ministry of Environment and Urbanization prepared the draft "By-Law on Persistent Organic Pollutants" for harmonization and implementation of the EU Regulation on Persistent Organic Pollutants related to the implementation of the Stockholm Convention in the EU, and the By-Law was published in OG 30595 dated 14 November 2018. The By-Law aims to protect human health and the environment from the negative effects of persistent organic pollutants. The By-Law covers the provisions regarding the prohibition of the production, placing on the market and using of the persistent organic pollutants, phasing out or restricting them as soon as possible, the minimization of the releases of these substances, and the wastes consisting of, containing them or contaminated by any of these substances.

Moreover, the "Draft By-Law on Concerning the Export and Import of Certain Hazardous Chemicals" has been prepared for the establishment of the notification mechanism within the scope of "the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade" and the implementation of the relevant EU legislation and it is envisaged to be published in 2020.

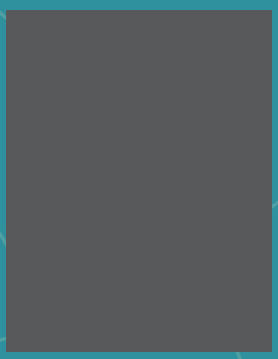
Furthermore, our country signed the "Minamata Convention on Mercury", prepared under the leadership of the United Nations Environment Program (UNEP) to contribute to efforts for preventing global environmental pollution caused by mercury, on 24 September 2014 and started the process of acceding.

The "Project on Preliminary Assessment Mercury", which includes an infrastructure work for the implementation of the Minamata Convention in our country and approved by the Global Environment Fund (GEF), was carried out between 2017-2019 and in this context, the process of acceding to the Minamata Convention was completed and studies were conducted to determine the current situation in the country.

Resources

Ministry of Environment and Urbanization

F. NATURE CONSERVATION AND BIODIVERSITY



F. NATURE CONSERVATION AND BIODIVERSITY

F.1. Biodiversity of Turkey and Its Importance

Turkey has agricultural, forest, mountain, steppe, wetland, coastal and marine ecosystems and different forms and combinations of these ecosystems.

This ecosystem and habitat diversity has come with important species diversity. When compared in terms of the biodiversity of the countries in the temperate zone, it is observed that the animal (fauna) biodiversity is quite high in our country. Despite the lack of data, invertebrates constitute the largest number of living species specified. The number of invertebrate animal species is approximately 19,000, of which approximately 4,000 species/subspecies are endemic. The total number of vertebrate animal species has been specified until today is nearly 1,500. Over 100 species of vertebrates, 70 of which are fish species, are endemic. The fact that Turkey is located on the two great bird migration routes of the world increases its importance as a feeding and breeding ground for birds.

It will be sufficient to compare with the European continent to understand the richness of Turkey in terms of plant (flora) species. While there are 12,500 gymnosperms and angiosperms in the whole European continent, it is known that there are nearly 11,000 species just in Anatolia.

Turkey's genetic diversity becomes more of an issue due to its plant genetic resources since Turkey is located at the intersection of the Mediterranean and the Near East Gene Center. These two regions play a very important role in the emergence of cereals and horticultural crops. There are 5 micro-gene centers in our country, in which more than 100 species show wide variation and which are the origin or diversity centers of other economically important plant species such as many important cultivated plants and medicinal plants. These centers offer very important genetic resources for the future sustainability of the agriculture of numerous plant species cultivated in the world. In terms of animal genetic resources, it is accepted that many native animal breeds have been raised in Anatolia and spread to other parts of the world from here.

Another important issue on the conservation of biological diversity is the principles of integration of "sustainable use" into sectoral practices. Sustainable use is the establishment of a balance between use and conservation, taking into account the self-renewal and maintenance capacity of natural resources. Thus, both the optimum benefit from biodiversity can be obtained and the continuity of this diversity is guaranteed.

Although the number of plant species in the whole of Europe is around 12,500, the number of plant species specified in Turkey has almost reached this number today. Nearly 3,000 of these species are endemic ones unique to Turkey. While the number of species that make up the European fauna and animal existence is nearly 60,000, this number is nearly 80,000 in our country.

There are around 150 mammals, around 480 birds, around 130 reptiles, and around 300 fish species in Turkey. Among these, 15 mammals, 46 birds, 18 reptiles, and 5 frog species are in danger of extinction. The total wetland area of our country is over 1 million hectares. There are more than 250 wetlands. These natural resources and living resources need to be conserved. For this purpose, our country has become a party to various international conventions, and its efforts to become a party continue. As a result of the degradation and destruction in the ecosystem, many animal species have been endangered and many of them have become extinct.

The Convention on Biodiversity was ratified by Turkey under Law No. 4177 dated 29 August 1996 and entered into force in May 14, 1997. The Ministry of Agriculture and Forestry is a national focus of the UN Convention on Biological Diversity and is responsible for ensuring inter-institutional coordination and cooperation in activities carried out for the conservation and sustainable use of Turkey's biodiversity.

Turkey has been participating in the meetings of the Conference of the Parties as a party country since 1998. An exchange mechanism has been created through the addresses of www.bcs.gov.tr in Turkish and of www.cbd.gov.tr in English within the scope of Article 17 of the Agreement to provide information exchange at the national and international level.

Turkey has three phytogeographical regions and each has its unique species and natural ecosystems. These are Europe-Siberia, Irano-Turanian, and the Mediterranean. Diversity in Anatolian geography and climate in the emergence of many micro-gene centers.

While there are micro-gene centers of wheat, barley, chickpea, and lentil of which Anatolia is the first-degree gene center, there are also species such as apple, pear, cherry, black cherry, melon, and watermelon, etc., of which main gene center in Central Asia, gradually diversified and enriched in Anatolia, where their secondary gene centers are formed.

Table 83 – Micro-gene Centers and Common Species in Turkey (Şehirali et all., 2005).

Micro-gene Center	Common Species
Thrace-Aegean	Bread wheat, durum wheat, crane wheat, Topbaş wheat, hot spring wheat, spelled wheat, coarse grain, melon, lentil, chickpea, common vetch, lupines, clover.
South-East Anatolia	Hot spring wheat, gernik wheat, durum wheat, vegetable marrow, watermelon, melon, cucumber, vine, beans, lentil, chickpea, broad bean, fodder crops.
Samsun -Tokat- Amasya	Amasya fruit genera and species, bean, lentil, broad bean, legume forage crops.
Kayseri and Neighborhood	Elm Apple, almond, pear, fruit types, vine, lentil, chickpea, clover, sainfoin.
Ağrı and neighborhood	Apple, apricot, sour cherry, cherry, melon, legume forage crops.

The richest region in terms of endemic species is the Mediterranean Region, followed by Eastern and Central Anatolia, Black Sea, Aegean, Marmara, and Southeastern Anatolia regions respectively.

Table 84 – Distribution of Endemic Species in the Turkish Flora by Regions (Eken et all, 2006).

Regions	Number of endemic species
Mediterranean Region	862
Aegean Region	171
Eastern Anatolian Region	471
Marmara Region	102
Central Anatolian Region	335
Southeastern Anatolian Region	64
Black Sea Region	277
Total	2,282*

* The remaining endemic species are distributed in more than one geographical region.

The total number of cereal varieties that have been developed and recorded with the use of local and imported breeds by the public in Turkey in the last thirty years is 333; 50 of which are wheat, 28 are corn, 35 are corn lines, 50 are barley, 44 are rice, 16 are sorghum, 8 are oat and 1 is rye variety. The National Seed Program constantly grows new varieties and thus the number of cultivated varieties is gradually increasing, while field crops such as small red wheat (Triticum monococcum), double grain wheat (Triticum dicoccum), bitter bush, and lupine are not used today as much as in the past. Therefore, these species have begun to extinct.

The R&D Centers established within TAGEM or under progress related to Plant Genetic Resources and are as follows:

- The National Gene Bank; Aegean Agricultural Research Institute. Menemen İzmir.
- Turkish Seed Gene Bank; Central Research Institute for Field Crops Ankara
- Field Gene Banks: 17 banks
- Medicinal and Aromatic Plants Research Centre, West Mediterranean Agricultural Research Institute, Antalya
- Herbal Biotech Centre: Central Research Institute for Field Crops, Ankara
- Geophytes Garden of Turkey: Yalova Atatürk Central Horticultural Research Institute
- National Botanical Garden of Turkey; Ankara
- Plant Tissue Culture Center: Aegean Agricultural Research Institute.
- World Olive Collection Garden; Bornova Olive Production Research Institute

F.1.1. Ecosystems in Turkey

F.1.1.1. Agricultural Ecosystems

The main agricultural ecological zones of Turkey are Mediterranean Coastal Region, Aegean Coastal Region, Black Sea Coastal Region, Thrace, and Marmara Region, Central Anatolia Region, Southeastern Anatolia Region, Eastern Anatolia Region, and Passage Regions (Northwest Passage, West Passage, Northeast Passage, East Passage, Southeast Passage).

This zoning system is primarily based on the main climatic elements such as precipitation and temperature and covers the agricultural product diversity and the zonal and phenological characteristics of agriculture. Coastal regions can be defined as agricultural production regions generally located in the Mediterranean climate zone. Harsh continental climate dominates Central, Eastern, and Southeastern Anatolia and agricultural products reflect the characteristics of the climate. The Passage Zones are agricultural regions that cover several provinces in the transition road from the middle of Central Anatolia to other regions and they are more or less different from the other in terms of both climate factors and general agricultural characteristics.

More productive pasture vegetation has been formed in these zones due to high precipitation and better soil conditions. The grazing areas of arid and semi-arid zones of which total annual precipitation varies between 200 and 700 mm are called steppe pastures. The steppe pastures are divided into two as "mountain steppes" and "plain steppes" according to their altitude and topography. Since altitude and rainfall are relatively higher in mountain steppes, more valuable Gramineae and legume forage crops are cultivated in these areas.

F.1.1.2. Steppe Ecosystems

The steppe and meadow areas defined as the areas covered with herbaceous plants in Turkey are around 21 million hectares today. Steppe ecosystems are common in Turkey, especially in the high mountain floors of Central Anatolia, Aegean, and Mediterranean Regions and a large part of Eastern Anatolia. The most characteristic feature of the steppe ecosystem is that annual or perennial herbaceous plants are dominant. The floristic composition of steppe vegetation is very rich and includes many endemic plants.

Steppe formation in Turkey is generally divided into two as "Plain Steppe" and "Mountain Steppe" according to the topographic structure of the area it spreads. The plain steppe steppes are located at an altitude of 800-1,200 meters on flat or low-pitched terrains and provide a habitat for halophytes, goosefoot, sedges and cattails, and reed family members and species such as harmal, sagebrush, thyme, and sage.

The mountain steppe is common between 1,300-2,500 meters. It includes the species of tragacanth, spiny sainfoin, quill, affodill, and thyme species. Different from other regions, the Eastern Anatolian mountain steppe is more dominated by giant fennels. Subalpine and alpine meadows cover large areas in the high parts of the Eastern Black Sea mountains and the northern and northeastern parts of Eastern Anatolia.

F.1.1.3. Forest Ecosystems

Coniferous forests are more common in Turkey. Callitris trees are found at all altitudes from sea level to the highest limit where forests are found. There are moist, semi-humid coniferous, and dry forests (oak, black and Turkish pine) as well as shrubs and maquis in the Aegean and Mediterranean Regions.

Forest types according to biogeographic regions are as follows:

Euro-Siberian Biogeographical Region:

- Leaved coniferous forests (Beech, Chestnut, Hornbeam; 500-1,200 m),
- Humid, semi-humid coniferous forests (Black pine, Yellow pine, Spruce, Abies; 1,000-1,500 m),
- Dry oak and pine forests (Oak<1,500 m; Black pine>600 m; Turkish pine: 400-500 m),
- Brush (Maquis- pseudomaquis) formation (Turkish pine <500 m).

Mediterranean Biogeographic Region:

- Brush (Maquis and Garrigue) formation (Oaks, Mediterranean Strawberry Tree, Terebinth, Myrtle, etc. 350 m Marmara, 600 m Aegean; 800 m Mediterranean),
- Low Altitude Mediterranean Belt Forests (Turkish pine <1,000 m; Black pine:800-1,500 m),
- Aegean High Altitude Mountain Forests (Chestnut <1000 m; Beech, Lime Tree, Hazel Tree >1,500 m; Yellow Pine>1.600 m; Oak-Black Pine>700 m, Turkish pine <600 m),
- Mediterranean High Altitude Mountain Forests (Oak:500-1,200 m; black pine:1,200-200 m; Abies:1,200-1,800 m; Sedar:1,000-2,000 m; Juniper:100-1,800 m; Beech - Hornbeam:1,100-1,900 m).

Irano-Turanian Biogeographic Region:

- Central Anatolian Steppe Forests (Iron oak and Downy oak, Black Pine, juniper: 800-1,500 m),
- Central Anatolian Dry Black Pine, Oak and Juniper Forests (Oaks: <1.200 m; Black Pines:1,000-1,500 m; Yellow Pines>1,500 m),
- Eastern Anatolian Dry Oak Forests (Oak species <850 m).

These wealthy forest ecosystems of Turkey provide habitat for many endemic plant species, important bird species and many wildlife species. Also, there are wild relatives of many cultivated plants that are important for agricultural biological diversity in these ecosystems.

F.1.1.4. Mountain Ecosystems

There are mountains in Turkey that are formed by land folding, faulting, and volcanic eruptions. Types of mountain ecosystems vary according to biogeographical regions, mountain formation type, and altitude.

Fault-block mountains are located in the Aegean Region. These mountains are perpendicular to the shore and rich in water resources. Kaz Mountains, Yunt Mountains, Boz Mountains, Aydın, and Menteşe Mountains are important mountains of this region. Kaz Mountains are the habitat of Kaz Mountain Fir (Abies nordmanniana ssp. Equi-trojani), which is important due to both its endemic nature and genetic diversity.

The most important mountain ranges of Turkey formed as a result of Alp-Himalayan folding are Yıldız, Köroğlu, Küre, Canik, Eastern Black Sea Mountains in the north; Western and Central Taurus Mountains in the south; Nur and the Taurus Mountains in the southeast; Hınzır, Tahtalı, Munzur, Palandöken, Allahüekber and Aras Mountains in Central and Eastern Anatolia. These mountain systems, especially the Taurus Mountains, are important ecosystems in terms of biological diversity and a high rate of endemism. Subalpine and alpine meadows are dominant in the high parts of the Eastern Black Sea mountains and the northern and northeastern parts of Eastern Anatolia, and steppe and meadow ecosystems are dominant in the high mountain floors of other regions. At low altitudes, forest ecosystems begin to differ according to regions. Additionally, the lakes that are isolated from each other and have different characteristics, located in high mountain areas, create special habitats.

The most important volcanic mountains, which contribute biodiversity especially with its volcanic lakes, are Ağrı, Tendürek, Nemrut, Süphan, Karacadağ, Erciyes, Hasan, and Kula mountains. Volcanic mountains are also important for agricultural biodiversity with their mineral-rich soil.

F.1.1.5. Inland Water Ecosystems

Turkey has inland water resources that are very important for maintaining biological diversity with its rivers and lakes covering an area of approximately 10,000 km^2. 921 natural wetlands larger than 8 ha have been specified in Turkey within the studies carried out so far. Seven drainage basins embody 25 river basins in Turkey and the amount of groundwaters is estimated at around 94 billion km^3. The annual average rainfall is about 640 mm and approximately one-third of this amount reaches water reserves and contributes to the survival of wetlands.

The largest of the natural lakes is Lake Van in the Eastern Anatolia Region, with an area of 374,000 hectares and with high salinity. There are some shallow salty lakes in the Central Anatolian Plateau, the largest of which is Lake Tuz (128,000 hectares). Lake Tuz becomes desiccated almost completely in summer and the lake is covered with a 30 cm thick salt layer. Accordingly, only salt-resistant vegetation grows around the lake. Lakes, swamps, deltas, reeds, and mudflats are very important for wildlife, especially for birds. More than half of the bird species in Turkey are migratory. Wetlands provide an important resting and wintering environment for the waterfowl.

There are nine rivers in Turkey with a length of more than 500 km: Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilırmak and Ceyhan. The annual discharge of rivers in Turkey is approximately 41 billion m^3 to the Black Sea and 36 billion m^3 to the Mediterranean. Dicle and Fırat rivers flow into Iraq and Syria respectively. Deltas are of great importance in terms of biological diversity, especially for water birds. The Meriç, Gediz, Büyük Menderes and Küçük Menderes Deltas formed by the rivers flowing into the Aegean Sea and the Göksu, Seyhan and Ceyhan Deltas formed by the rivers flowing into the Mediterranean create habitats suitable for waterfowl in many and species, especially as a result of the freezing of the lakes in Anatolia in winter. The delta formed by the Kızılırmak river that flows into the Black Sea is especially important for migratory birds crossing the Black Sea directly.

Since the geographical structure of Turkey is complex and the rivers are separated by mountainous regions, this situation prevents the spread of the species to a great extent and causes high endemism and genetic diversity. For this reason, most of the invertebrates living in river ecosystems are endemic species. As the salinity rates of the waters in the Köyceğiz-Dalyan Region vary from zero to hyper- salty, it sets a good example in terms of the relationship between habitat and species diversity. Lindenia tetraphylla is a new species in Turkey, and this species has been noted to be extinct in the Balkans. Artodiaptomus burduricus, which lives in Lake Burdur and has adapted to different conditions, is an endemic invertebrate species and important in terms of genetic diversity. Moreever, Aphanius burduricus, which lives in Lake Burdur, is one of the endemic fish species that has adapted to the lake conditions. Similarly, Alburnus tarichi, an endemic fish species living in Lake Van, has adapted to the extreme conditions of this lake.

Plants such as reed cattail (Typha sp.), Common reed (Phragmites sp.) bulrush (Schoenoplectus sp.), rushes (Juncus sp.) form large communities in Turkish wetlands. Also, some aquatic plants such as wild mandrake (Phodophyllum sp.), duckweed (Wolffiasp.), and Ceratophyllum sp., Myriophyllum sp., Potamogeton sp. living in shallow lakes as well as water lily (Nymphae sp.), covering the water surface, are encountered in Turkey.

F.1.1.6. Coastal and Marine Ecosystems

The fact that the seas surrounding Turkey, including the Black Sea, Marmara, Aegean, and Eastern Mediterranean, have different characteristics from each other, differentiated the biological resources they contain. The Mediterranean, which has the highest salinity and temperature ratio among the Turkish seas, is the region with the richest biodiversity. Many species belonging to the IndianPacific Region, which migrated from the Red Sea to the Mediterranean after the opening of the Suez Canal, settled in this region. 26 species were identified to have settled in this region as a result of migration. Turkey provides habitat for 388 fish species in the Mediterranean Sea, 389 in the Aegean Sea, 249 in the Sea of Marmara, and 151 in the Black Sea.

Table 85 – Taxon Number of Species and Subspecies, Endemism Status, Rare and Endangered Species, Extinct Species of Various Plant Groups

Plant Groups	Defined Species/subspecies	Endemic Species	Rare and Endangered Species	Extinct Species
Algae (Algne)	2,150	…….,	unknown	unknown
Lichens (Lichenez)	1,000	…….,,	unknown	unknown
Bryophytes (Bryophy tez)	910	2	2	unknown
Pteridophytes (Pteridopphy tez)	101	3	1	unknown
Gymnosperms (Gymnozpermz)	35	5	1	unknown
Monocotyledons (Monocoo ledonz)	1,765	420	150	-
Dicotyledons (Dicoo ledonz)	9,100	3,500	1,100	11

The Black Sea is the largest and most isolated inland sea from the oceans. There are 151 fish, 1.619 fungi species, algae, and tall aquatic plant species and, 1983 invertebrate species in the Black Sea. Fish species such as sturgeon and 3 marine mammal species, which are important in terms of biological diversity and economic value, live in the Black Sea. Although their coverage area has shrunk, there are still 6 seagrass species (Zostera marina, Z. Noltii, Potamogeton pectinatus, Ruppia maritima, R. Spiralis, and Zannichellia major), that provide spawning ground for 34 fish species.

The Turkish Straits System, consisting of the Straits of Istanbul and Çanakkale and the Sea of Marmara, is an inland sea system that provides water transport between the Aegean Basin of the Eastern Mediterranean and the Black Sea and serves as a biological corridor for fish species such as bonito, toric, and bluefish. It has been observed that the surface of the Sea of Marmara is under the influence of the Black Sea waters coming through the Bosphorus. The deeper areas of the Sea of Marmara contain Aegean-Mediterranean waters and host more than 400 benthic organism species. The Sea of Marmara is the spawning ground for many pelagic fish species. Gerardia savaglia, a coral species, still survives at a depth of 30 m.

Coastal ecosystems are very special ecosystems because they are important transitional zones (ecoton) where marine and land ecosystems intersect. Coastal ecosystems constitute 4.1% of the terrestrial resources that make up the country's surface area. Since the way the mountains descend to the sea and the coastal topography differ from each other in the coastal regions of our country, various coastal ecosystems such as dunes, caves, deltas, lagoons, dunes, and calcareous terraces have emerged. Among all these coasts, especially the coastal areas in the Eastern Mediterranean Region are rich ecosystems of very high flora and fauna diversity. There are thousands of sea caves along the coast of Turkey, which have very different geological structures and contain many fish species and other sea creatures. Some of these caves have been defined as the shelter and breeding grounds of the Mediterranean monk seals. There are approximately 3,000 species in our coastal waters. Mediterranean monk seals, sea turtles, sea meadows, sea birds are among the most important species of coastal biodiversity.

F.1.2. Species Diversity in Turkey

Given its climate zone, especially in terms of seed plants, Turkey has a very rich position in terms of plant species.

Algae are the most primitive organisms in the plant group. The organisms in this group can be small enough to be seen under a microscope, and some reach 50-60 meters or even 100 meters in length. Although the number of studies on algae has increased, identification of the Algae Flora in Turkey has not been completed yet.

Distribution of endemic plants by Plant Geography Regions (PGR) (including subspecies and varieties)	
Euro-Siberian	320
Mediterranean	1,325
Irano-Turanian	1,250
Non-specific to Plant Geographical Regions	1,030
Total	3,925

Lichens are a group of organisms based on symbiosis formed by fungi with algae. They spread almost all over the world. The number of species known in the world is around 20,000. Studies on lichens in Turkey have increased rapidly in recent years. The number of Lichen species known in Turkey today is nearly 1,000 and this number is increasing day by day.

Mosses are the most primitive group of plants with underdeveloped vascular bundles. It has been determined that 3 Hornwort Liverwort, around 165 Liverworts, and around 740 Mosses spread in Turkey.

Ferns are the most well-known group of plants, along with seed plants. Ferns are common in every part of Turkey, except for the very arid regions, but this plant group is the most common in the Black Sea Region. There are 8 species of Horsetail (Equisetales), 6 species of Clubmosses (Lycopodiales), and around 80 species of common fern mosses in Turkey.

The number of vascular plant species defined in Turkey has reached 11,707 today, considering the taxon number of genus and subgenus. This number is increasing day by day as new species are identified. This species richness cannot be found in any other country in Europe. For this reason, Turkey shows continental properties in terms of plant diversity. Because the number of species in all of Europe is around 12,500.

F.1.2.1. Endemic/Endangered Plant Species

Turkey is one of the richest countries in the world in terms of endemic plants due to its geographical zone. Since the species belonging to cryptogamic plants are widely distributed as in the whole world, their endemism rate is low. Moreover, studies on cryptogamic plant groups in Turkey are unsatisfactory. The most well-known plant group among cryptogamic plants is Ferns (Pteridophytes). The number of species and sub-species of Ferns specified in Turkey is 101 and only 3 of them are endemic. The rate of endemism is low in gymnosperms, the most primitive group of seed plants. There are only 5 endemic taxa at the variety and subspecies level in this group. The endemism rate of the flowering plant group (Angiospermae) among the seed plants was very high, and the total number is found to be 11,707 when subgenus taxa are added, and 3,649 of them are endemic. The endemism rate is around 31.82%. It has been determined that there are around 1,000 endemic plants in Greece which is the country with the highest endemic species rate among European countries. This shows how rich Turkey is in terms of endemic plants.

While some of the endemic plant species that spread in Turkey have a narrow range, some of them have a wide range. Narrow-range endemics mostly found on certain mountain and mountain ranges and in certain habitats. The main mountains with a high rate of endemism are mountain ranges such as Amanos Mountains, Sandras Mountain, Bey Mountains, Bolkar and Aladağlar, Uludağ, Kazdağı, and Munzur Mountains. Central Taurus Mountains (Ermenek, Gülnar, Mut, Anamur), Antitoros (Maraş, Adana, Niğde), gypsum-bearing areas around Sivas and Çankırı, Lake Tuz and its neighborhood, high mountains around Rize and Artvin, and the area covering Van-Bitlis-Hakkari provinces can be considered among the regions with high endemism rates, apart from mountain ranges.

The richest family in terms of endemic seed plant species is the daisy family (Compositae) and it has nearly 435 endemic species. This family is also one of the most crowded species in Turkey. The second most crowded family is the legume family (Leguminosae) with nearly 400 endemic species. This is the second family in Turkey in terms of the number of species contains in this family. The third richest family is the Lamiaceae (Labiatae) family with approximately 310 endemic species. The richest genus in terms of the number of endemic species is milkvetch (Astragalus) with approximately 250 species. This genus is followed by mullein (Verbascum) with 175 species, Knapweeds (Centaurea) with 115 endemic species, and Hieracium with 66 species. On the other hand, Ebenus (14 species) and Bolanthus (6 species) have low numbers of species in Turkey, but all their species are endemic and thus endemism rate of these plants is 100%.

Turkey might also be considered as rich in endemic genera as well as endemic species. The genera that are represented by only one species are Kalidiopsis and Cyathobasis (Chenopodiaceae), Phryna and Thurya (Caryophllaceae), Physocardamum and Tchihatchewia (Cruciferae), Nephelochloa and Pseudophleum (Gramineae), Dorystoechas (Labiatae), Sartoria (Leguminosae), Crenosciadium, Ekimia, Postiella and Aegokeras (Umbelliferae).

Among the phytogeographical regions, the Irano-Turanian Region hosts the most endemic species. It is followed by the Mediterranean and Euro-Siberian phytogeographical regions. The most endemic species are found in the Mediterranean Region, among the geographical regions, with about 800 species, followed by Eastern Anatolia with 380 species and Central Anatolia with 280 species.

Although Turkey is very rich in endemic plant species, some of these rich species face serious threats. According to the criteria of the International Union for Conservation of Nature (IUCN 2001), about 600 of our endemic species are in the "Critically Endangered CR" category and around 700 in the "Endangered

EN" category. As a result of the "Turkish Endemic Plant Project" carried out between 1992-1997 and supported by the abolished State Planning Organization, seeds of many endemic plants were collected and taken under protection at the Menemen Gene Bank in the Aegean Agricultural Research Institute.

Turkish flora, with a high rate of endemism, is also rich in medicinal and aromatic plants. Some of the species used for medicinal and aromatic purposes are Delphinium sp., Digitalis sp., Gypsophila sp., Helichrysum sp., Leucojum aestivum, Linum sp., Liquidambar Orientalis, Malva sp., Matricaria sp., Mentha sp., Nigella sp., Orchis sp., Ophrys sp., Origanum sp., Pimpinella sp., Rosa sp., Salvia sp., Sideritis sp., Teucrium sp. and Thymus sp.

F.1.2.2. Animal Species

While Turkey is rich and interesting in terms of flora, it is rich in fauna as well, due to its geographical location. The main reasons for this are that Anatolia acts as a bridge between the European and Asian continents and therefore Anatolia is located on the migration route, has different a climate and ecosystem types, has a rich flora, and therefore many animal species in need of food can find a suitable habitat for them.

As well as being rich and interesting in terms of flora, Turkey is also rich and interesting in terms of fauna due to its zone. The main reasons for this are that Anatolia acts as a bridge between the European and Asian continents and hence it is located on the migration route, it has a different climate and ecosystem types and rich flora, and hence many animal species in need of food can find a suitable habitat.

Table 86 – Taxon Number of Species and Subspecies, Endemism Status, Rare and Endangered Species, Extinct Species to various animal types

Animal Groups	Defined Species	Endemic Species/ Subspecies and Variety	Rare and Endangered Species	Extinct Species
		VERTEBRATES		
Reptiles amphibians (Reptilia Ambhibia)	141	16	10	-
Birds (Avez)	460	-	27	-
Mammals (Mammalia)	162	37	23	-
Freshwater fish (Pisces)	236	70	-	-
Saltwater fish (Pizces)	450		-	-
		INVERTEBRATES		
Mollusks (Molluzca)	322	203	unknown	unknown
Butterflies (Lepideptera)	6,500	59	59	unknown
Grasshoppers (Orthoptera)	600	270	-	-
Dragonflies (Odonata)	114		-	-
Coleopteran (Coleoptera)	10,000	-3,000	-	-
True bugs (Heteroptera)	-1,400	-2,00		-
Homoptera	-1,300	-2,00	-	-

Like all over the world, the insect (Insecta) group is very rich in Turkey. However, it is possible to give estimated figures about the Turkish insect fauna since there is no research regarding some groups, and the research conducted on some groups is insufficient. The insect species that have been detected in Turkey so far is approximately 30,000. However, the estimated number is between 60,000-80,000. These numbers show the insufficiency of researches on insect species in Turkey. Despite this, the faunistic list of some insect groups has been largely drawn. For example, the dragonflies (Odonata) are represented

by 114 species, grasshoppers (Orthoptera) by 600 species (270 of them are endemic), coleopteran by 10,000, mollusks (Mollusca) by 522 species (203 of them are endemic), true bugs (Heteroptera) by 1,400 species, Homoptera by 1,500 species, butterflies (Lepidoptera) by 6,500 species (600 diurnal others are nocturnal).

Although some habitats in Turkey have been deteriorated and even damaged, Mediterranean and Aegean coasts provide habitats for endangered species such as Mediterranean seals (Monachus monachus), sea turtles (Caretta caretta), and green sea turtles (Chelonia mydas).

F.1.2.3. Endemic / Endangered Animal Species

Turkey is very rich and interesting in terms of fauna as well as floristics. Many types of research have been conducted on vertebrate animals in Turkey and continue to be done. Thus, more accurate data can be provided on endemism status species, their risk categories, and protected species. According to this data, 16 of 141 reptile and amphibian species spread in Turkey are endemic, 10 of which are endangered. There are no bird species endemic to Turkey. However, 5 species of mammals, 32 subspecies, 16 species and /or subspecies of reptiles, and 70 species/subspecies of freshwater fish are endemic.

Some of the endemic and endangered reptile and amphibian species are as follows:

- Luschan's salamander (Mertensiella luschani),
- Neurergus (Neurergus crocatus crocatus and N. Strauchii barani),
- Common newt (Triturus vulgaris kosswiigi),
- Banded newt (Triturus vittatus cilicensis),
- Fire-bellied Toad (Bombina bombina arifiyensis),
- Taurus Frog (Rana holtzi),
- Armenian lizard (Lacerta saxicola),
- Anatolian Lizard (Lacerta cappadocica),
- Taurus Lizard (Lacerta danfordi anatolica),
- Balkan Green Lizard (Lacerta trilineata),
- Caucasian Rat Snake (Elaphe hohenackeri),
- Meadow viper (Vipera ursinii),
- Pontic adder (Vipera pontica).

Of the 481 bird species identified, 23 species, although not only endemic, are endangered. Some of the endangered bird species include:

- The Dalmatian pelican (Pelecanus crispus),
- Greater white-fronted goose (Anser albifrons), This species is not under threat, either. Instead Anser erythropus (the lesser white-fronted goose) VU can be written,
- Red-breasted goose (Branta ruficollis),

- Greater white-fronted goose (Anser albifrons), This species is not under threat, either. Instead Redhead (Aythya ferina) VU can be written,
- White-headed duck (Oxyura leucocephala),
- Greater spotted eagle (Aquila clanga), the Latin name of this species changed to Clanga clanga. Its status is VU.
- Eastern imperial eagle (Aquila heliaca),
- Lesser kestrel (Falco naumanni), Corn crake (Crex crex),
- Otis tarda: Toy (not a big toy, just a toy)
- Slender-billed curlew (Numenius tenuirostris).

The bald ibis (Geronticus eremita), whose natural population is extinct, is under effective protection. The vast majority of other bird species are also among the endangered species that require protection.

Of 161 mammal species identified in Turkey, 37 sub-species and/or varieties are endemic. 23 of these species are endangered and taken under protection. Some important species distributed over Turkey are Goitered gazelle (Gazella subgutturosa), Mountain gazelle (Gazella gazella), Fallow deer (Cervus dama), and mouflon (Ovis orientalis). Moreever, the striped hyena (Hyena hyena) is a rare species. And it is known that Anatolian leopard (Panthera pardus tulliana), Caspian tiger (Panthera tigris virgata) and Asiatic lion (Panthera leo persica) species became extinct in Anatolia.

There is no endemic and endangered species of saltwater fish. However, 70 of 236 freshwater species are endemic and 4 species became extinct. Some of the endangered and endemic freshwaters species are as follows:

- Scaleless killifish (Aphanius asquamatus)
- Beyşehir bleak (Alburnus akili)
- Karasu Sha Kuli (Alburnus timarensis)
- Italian barbel (Barbus plebejus kosswiigi)
- Pamphylian scraper (Capoeta antalyensis)
- Cihanbeyli gudgeon (Gobio gobio insuyanus)
- Tigris chub (Leuciscus kurui)
- Brown trout (Salmo trutta abanticus)

Although the Turkish invertebrate fauna is not as well known as the vertebrates, it is known that there are 30,000 identified and approximately 60,000-80,000 estimated species. The rate of endemism is also very high in invertebrate animal groups.

F.1.3. Genetic Diversity in Turkey

Plant genetic diversity is of great importance both for Turkish and world agriculture. Turkey is in a very special position in terms of plant genetic resources. The Mediterranean and Near East Centers, one of the centers of diversity and origin explained by Vavilov, overlap in Turkey. According to J. Harlan, there are

5 micro-gene centers in Turkey where more than 100 species show wide variation and it is the origin or diversity center of many important cultivated plants and other plant species.

Turkey is located at the intersection of two important Vavilovian gene centers; the Mediterranean and the Near East.

- Thrace-Aegean Region: bread wheat, durum wheat, Poulard wheat, degnek wheat, einkorn, lentil, chickpea, melon, vetch, lupine, and clover.
- Southern – South-eastern Anatolia: Emmer (Tritucum dicoccum), einkorn, Aegilops speltoides, marrow, melon, cucumber, common bean, lentil, broad bean, vine, and forage plants.
- Samsun, Tokat, Amasya: Various fruit families and species, broad bean, common bean, lentil, and various legumes used as animal feed.
- Kayseri and neighborhood: almond, apple, green peas, fruit species, vine, lentil, chickpea, alfalfa, and sainfoin.
- Ağrı and neighborhood: apple, apricot, cherry, black cherry, forage grain plants, and watermelon

Some cultivated plants where Turkey is the center of gene and origin, located where these two separate gene and diversity centers overlap, can be listed as follows: Triticum, Hordeum, Secale, Avena, Linum, Allium, Cicer, Lens, Pisum, Medicago, and Vicia. In Turkey, there are 25 wild relatives of wheat (Triticum ve Aegilops), 8 wild relatives of barley (Hordeum), 5 wild relatives of rye (Secale), and 8 wild relatives of oat (Avena).

Turkey is also rich in wild relatives of edible legumes and forage plants. There are 4 species of lentil (Lens), 10 species of chickpea (Cicer), 104 species of trefoil (Trifolium; 11 of them are endemic), 34 species of clover (Medicago), 42 species of sainfoin (Onobrychis), 60 species of vetches (Vicia; 6 of them are endemic) in our country. Turkey is also a micro-gene center of Amygdalus spp., Cucumis melo, C. sativus, Cucurbita moshata, C. pepo, Malus spp., Pistachio spp., Prunus spp., Pyrus spp. and Vitis vinifera species (Tan, 1998). Additionally, Turkey is the native land of many ornamental plants such as tulip and snowdrop.

With the awareness of the importance of agricultural plants, many species and varieties from each of these genera are grown within the framework of seed production and distribution programs in our country. Field crops include wheat, barley, corn, chickpeas, lentils, white beans, sunflower, potatoes, soybeans, peanuts, sesame, tobacco, cotton, and sugar beets; animal feeds include sorghum, rye, genista, and meadow grass. More than 200 plant species are included in the scope of this program. There are also thousands of local varieties, ecotypes, and transitional forms that farmers grow by using their resources.

The total number of cereal varieties developed and recorded in Turkey in the last thirty years using local and imported breeds is 256, of which 95 are wheat, 91 are corn, 22 are barley, 19 are rice, 16 are sorghum, 11 are oat and 2 are rye species. The National Seed Program constantly grows new varieties and thus the number of cultivated varieties is gradually increasing However, field crops such as einkorn wheat (Triticum monococcum), emmer (Triticum dicoccum), bitter vetch, and lupine are not used as much today. Therefore, these species have begun to disappear.

Garden plants, on the other hand, include about 50 species that are being produced and about 100 varieties that are grown and distributed. This group includes tomato, pepper, aubergine, lettuce, cabbage, broad bean, leek, marrow, cucumber, melon, watermelon, green bean, vegetable marrow, green peas,

spinach, carrot, onion, rocket, common purslane, fennel, cauliflower, parsley, and gherkin. Considering the local varieties and the varieties obtained from other sources, it is estimated that the total number of varieties grown in the country reaches 200.

Variety richness is also noticeable in fruit production. 80 of the fruit types estimated to be around 138 in number are grown in Turkey. Fruit and nut varieties in Turkey include apple, pear, quince, cherry, cherry, apricot, peach, fig, pomegranate, mulberry, almond, hazelnut, walnut, and pistachio. Viticulture has an important place in agriculture in Turkey. Anatolia, which also hosts the wild vine species (Vitis silvestris), is also the gene center of the grapevine (Vitis vinifera).

Turkey is also rich in forest gene resources. Some of the nationally and globally important species, which have gene resources in Turkey, are 5 pine species, 4 abies species, 20 oak species, 8 juniper species as well as Taurus cedar, oriental spruce, and oriental beech. Some major forest trees are pine species (Pinus brutia, P. nigra, P. sylvestris, P. halepensis, and P.pinea) abies species (Abies nordmanniana subsp. nordmanniana, A. nordmanniana subsp. bornmulleriana, A. nordmanniana subsp. equitrojani, A. cilicica subsp. cilicica, A. cilicica subsp. isaurica), Taurus cedar (Cedrus libani), beech (Fagus Orientalis), spruce (Picea orientalis), lime tree (Tilia spp.), alder (Alnus spp. 2 species total 6 taxons) juniper (Juniperus spp. 8 species) oak (Quercus around 20 species).

Turkey is an agricultural country where plants and animals have been raised since ancient times. Southeastern Anatolia Region, also known as Northern Mesopotamia, is considered to be one of the cultural centers where mankind first started settled agriculture. Therefore, it can be assumed that many native animal breeds acquired by passing civilizations were bred and spread from here to other parts of the world.

The crossbreeding of indigenous livestock with foreign breeds has revealed the danger of losing local gene resources. Almost all indigenous cattle on the Black Sea coastline have been converted to Jersey breed. However, only 25% of the indigenous breeds have been crossbred with developed breeds and 75% of them are still pure breeds. Similarly, the "Kıvırcık" sheep breed of the Thrace Region was crossed with the German "Ots-Friz" breed to develop the Tahirova breed, and this application resulted in genetic erosion of both endemic species. Some sheep breed varieties such as "Karakul" raised in the northern transition zone and "Tuj" raised in the Kars region are in danger of extinction. Another endangered native animal breed is the Ankara goat, which has been taken under protection to prevent it from extinction completely.

There are not enough researches on the genetic diversity of aquatic species and invertebrates (especially insects).

F.1.4. Agricultural Area and Steppe Biodiversity

Agricultural biodiversity is a broad term that includes all of the biological diversity components related to food and agriculture and that make up agricultural ecosystems. It refers to the diversity and variability of plants, animals, and micro-organisms at the genetic, species and ecosystem levels that are necessary to maintain the key functions, structure, and processes of agricultural ecosystems.

For a more detailed description, agricultural biological diversity comprises the plant genetic resources, including genetic resources for pasture and non-agricultural species and trees that are integral parts of farm systems, animal genetic resources including fish and insect genetic resources, microbiological and fungal genetic resources, components of agricultural biodiversity that provide ecosystem services and the abiotic factors affecting them(nutrient cycle, degradation of organic matter and soil fertility maintenance, pest and disease management, pollination, enrichment and maintenance of local wildlife and habitats within their landscapes, maintenance of the water cycle, erosion control, climate, and carbon balance), and socio-economic and cultural factors (traditional knowledge, cultural factors, agricultural landscapes, etc.).

Major agricultural ecological zones of Turkey are Coastal Mediterranean Region, Coastal Aegean Region, Coastal Black Sea Region, Thrace and Marmara Region, Central Anatolian Region, South-eastern Anatolian Region, Eastern Anatolian Region, and Passage Regions (Northwestern Pass, Western Pass, Northeastern Pass, Eastern Pass, South Eastern Pass). Although this zoning system depends firstly on main climatic factors such as precipitation and temperature, they also encompass agricultural crop diversity and regional and phenological features of agriculture.

Coastal regions can be defined as agricultural production areas generally located in the Mediterranean climate zone. Central, Eastern and Southeastern Anatolia Regions are the regions where the harsh continental climate prevails and thus, agricultural product characteristics also reflect the effects of these ecological areas. Transition regions, on the other hand, are agricultural regions that are more or less different from each other in terms of both climate factors and general agricultural characteristics, each covering a few provinces in the transition from the middle of Central Anatolia to other regions.

Table 87 – Indigenous Animal Breeds of the Steppe Ecosystem

INDIGENOUS ANİMAL BREED	BREED REGION
CATTLE BREEDS	
Anatolian Black	All Regions except Northeastern Anatolia and Thrace
East Anatolian Red	Whole Eastern Anatolia Until Ankara
Grey Steppe Cattle	Eskişehir, Kütahya
Kutlak cattle	Çorum territory
Southern Yellow	Southern and Southeastern Anatolia
Kilis Cattle	Gaziantep
Native Buffalo Breeds	Afyon, Kütahya, Uşak, Denizli, Kayseri
SHEEP BREEDS	
Akkaraman	From Eskişehir to Hakkari
Morkaraman	Erzurum, Erzincan, Bingöl
Ulaş-Kangal karamanı	Sivas, Malatya
Güney karamanı	Southern and Southeastern Antolia
Karakaş Sheep	Southeastern Antolia, especially Diyarbakır
Ödemiş Sheep	İzmir
Dağlıç	Bilecik, From Eskişehir to Aegean Region
İvesi	Southeastern Antolia
Herik Sheep	Eastern Black Sea Region
Hemşin Sheep	East part of Eastern Black Sea Region
Tuj Sheep	Kars
Kıvırcık Sheep	Thrace, Southern Marmara
Karakaya Sheep	Eastern Black Sea Region
Sakız Sheep	Aegean Coasts
İmroz Sheep	Çanakkale
Turkish merino	Marmara
Central Anatolian Merino	Central Anatolia
Malya Sheep	Central Anatolia

INDIGENOUS ANİMAL BREED	BREED REGION
GOAT BREEDS	
Ankara Goat	Ankara, Central Anatolia
Hair Goat	Central Anatolia
Kilis Goat	Southeastern Anatolia
White Goat	Central Anatolia
HORSE BREEDS	
Anatolian Horse	Central Anatolia
Çukurova horse	Southern and Southeastern Anatolia
Native Arabian horse	Southeastern Anatolia
Uzunyayla horse	Kayseri, Sivas
Canik horse	Black Sea Region
Malakan horse	Kars
Arabian horse	Southeastern Anatolia
POULTRY	
Native chicken	All Regions
Denizli breed	Denizli and neighborhoods
Gerze breed	Sinop
Naked neck	Muğla
Zile breed	Sivas
Native turkeys	All over Turkey
Native geese	All over Turkey
Native ducks	All over Turkey
Ankara rabbit	All over Turkey

Agricultural enterprises in Turkey are small, fragmented, and dispersed. This structure, which has negative consequences in terms of agricultural production, creates an advantage in terms of biological diversity as it provides small habitats in which wild plant and animal species can live. On the other hand, the fact that agricultural lands are generally within steppe ecosystems makes it difficult to distinguish between agricultural biodiversity and steppe biodiversity. Therefore, these two ecosystem structures have been considered together.

F.1.5. Forest Biodiversity

The Forest ecosystem in Turkey covers an area of 22,740,297 hectares (closely spaced 9,656,787 hectares) (29.2% of the country's surface area). Forests of coniferous trees are more common in Turkey (33 % broad-leaved trees, 47% coniferous, 20% mixed). Coniferous trees are found at all altitudes from sea level to the upper limit of forests. Humid and semihumid coniferous and dry forests (oak, black and Turkish pine s) are found as well as brushes and scrub in Aegean and Mediterranean Regions.

Its topographic structure, climate, and soil differences have made Turkey's forests very rich in terms of plant diversity. One of the main reasons for this wealth is the climatic changes that occurred in the fourth geological time. Approximately one-third of the plant species in Turkey originated in ancient geological periods and most of them are endemic. Most of the endemic species are distributed in the Mediterranean Plant Geographical Regions (especially in the Taurus Bolkar and Nur mountains) and the Irano-Turanian Plant Geographical Regions.

There are many ecosystems of forest habitats in Turkey based on both ecological and floristic composition, and the function of each ecosystem is more or less different from each other. These rich forest ecosystems in Turkey provide habitats for many endemic plant species, important bird species, and various wildlife species. Again, there are crop wild relatives in these ecosystems that are crucial for agricultural biological diversity.

The Mediterranean Plant Geographic Region covers all regions with a coast to the Mediterranean and the western parts of Thrace. In these regions, forest ecosystems form different vegetation series from sea level to the highest points of the mountains, depending on the soil-climate-plant relations. Different forest ecosystems in each vegetation series develop depending on other ecological parameters., the "Warm Mediterranean and the Trues Mediterranean Vegetation Layer" are seen in the areas of between 0-1.000 meters in the Mediterranean and Aegean regions where the Mediterranean climate is dominant in Turkey. The ecosystem seen on these layers are; Xerophilous scrub (Oaks, Mediterranean Strawberry Tree, Lentisk, Myrtle, etc.) ecosystem, Turkish pine (Pinus brutia) forest ecosystem, Aleppo Pine (Pinus halepensis) forest ecosystem, Oriental Sweetgum (Liquidambar Orientalis) forest ecosystem, Mediterranean cypress (Cupressus sempervirens) forest ecosystem, Mixed Oaks (Quercus cerris-Q. infectoria-Q. libani-Q brantii) ecosystem and the stone pine (Pinus pinea) forest ecosystem.

"Upper Mediterranean and Mediterranean Mountain Vegetation Layers" are seen on the areas of between 1,000-2,000 meters. The forest ecosystems seen at these altitudes are Black Pine (Pinus nigra), Taurus fir (Abies cilicica), cedar of Lebanon (Cedrus libani), common beech - common hornbeam (Ostrya carpinifolia-Carpinus orientalis), Mixed Oaks (Quercus petraea- Quercus cerris-Qurcus trojana) forest ecosystems. Unlike the Medirrenaean Region, Aegean High Mountain Forests include mostly mixed forest ecosystems in most places including chestnut, common beech, hazelnut, Yellow pine, oak, and Turkish pine.

"High Mountain Mediterranean Vegetation Layer" is found in areas of over 2,000 meters. At this altitude mixed juniper (Juniperus excelsa-Juniperus foetidissima) forest ecosystems are found as well as Mediterranean High Mountain Steppe ecosystem consisting of semi-shrub and herbaceous plants.

Irano-Turanian region is the widest of plant geographical regions and it stretches from Central Anatolia to Mongolia. Continental climate and steppes are dominant in this region. The region includes a wider area and the forest ecosystems in this region consist of arid region forestry and high mountain ecosystems. Some major forest ecosystem is Forest Steppe (Trees)- Central Anatolian (Turkey oak, Black Pine, juniper: 800-1,500 m), Dry Black Pine, Oak, and Juniper Forests- Central Anatolian (Oaks: <1,200 m; Black Pine: 1,000 - 1,500 m; Yellow Pine> 1,500 m), Dry forests –Eastern Mediterranean Oak Forests (Oak species < 850 m).

Euro-Siberian plant geographical region stretches all along Northern Anatolia and parts of Trace Region that are close to the Black Sea. It is the rainiest climate zone and thus its most parts are covered with forests. Remarkably, forest ecosystems under 1,500 m in this area are Dry Oak and Pine forests (Oak, Black Pine, Turkish pine) and scrubs and pseudomaquis. Between 500-1,200 m, there are coniferous forests (common beech -Fagus orientalis-, Sweet chestnut -Castanea sativa, Oriental Hornbeam -Carpinus orientalis-Carpinus betulus, common alder -Alnus glutinosa); between 1,000-1,500 m there are humid and semi-humid coniferous forests (Black Pine, Yellow Pine-Pinus sylvestris, Oriental spruce -Picea orientalis, Caucasian fir -Abies nordmanniana-). Mixed rhodies (Rhododendron ponticum, Rhododendron luteum, Rhododendron ungernii, Rhododendron smirnowii) and Silver birch (Betula pendula) forest ecosystems are present in higher areas of the Eastern Black Sea. On the other hand, floodplain mixed forests ecosystems (Fraxinus angustifolius-Qurcus robur –Fagus orientalis) are seen in flat alluvial areas with high groundwater of Thrace and the Western Black Sea.

Most of the mammals in Turkey live orest flora and a habitat for in forest ecosystems. Forests provided habitats for mammals such as Brown bear (Ursus arctos), Red fox (Vulpes vulpes), Wolf, Jackal (Canis aureus), Eurasian lynx (Lynx lynx), Hyena (Hyena hyena), Deer (Cervus elaphus), Chamois (Rupicapra rupicapra), Wild goat (Capra aegagrus), Wild boar (Sus scrofa scrofa), European badger (Meles meles), European pine marten (Martes martes), Hedgehog (Erinaceus europea), Rabbit (Lepus capensis), Least weasel (Mustela nivalis), Red squirrel (Sciurus vulgaris); reptiles such as Snake, Chameleon (Chameleo chameleon), Lizard (Lacerta agilis, L. armeniaca, L. parvula, L. derjugini, L. princeps, L. trilineata, L. viridis, Anguis fragilis), Spur-thighed tortoise (Testudo graeca) species; birds such as Ring-necked Pheasant (Phasianus colchicus), Caspian snowcock (Tetraogallus caspius), Caucasian grouse (Tetrao mlokosiewiczi), Woodpecker (Dendrocopus sp.), Accipitriformes (eagle species-Aquila sp., Pandion sp., goshawk species-Accipiter sp., Hen harrier species-Circus sp., hawk species-Buteo sp., Falcon species (Falco sp., Pernis sp. v.s.), strigiformes (Tawny owl -Strix aluco, Long-eared owl -Asio otus, Boreal owl -Aegolius funereus etc.) and many passeriformes species.

Species such as; Chamois (Rupicapra rupicapra), Wildcat (Felis silvestris), Cinereous vulture (Aegypius monachus), Eastern imperial eagle (Aquila heliaca), Greater spotted eagle (Aquila clanga) and Lesser spotted eagle (Aquila pomarina) forest fauna species protected by international conventions.

F.1.6. Mountain Biodiversity

Mountain ecosystems provide both different forest flora and habitat for various animal species, depending on factors such as the variability in the topographic structure of our country and the distances to the sea. In terms of ecosystem diversity, mountains are divided into sub-ecosystems such as alpine meadows, sub-alpine meadows, moving slopes, thorny pillow formation steppes, and the floristic composition of each ecosystem is different from each other. Information on the species richness of mountain steppes is provided in "F.1.4. Agricultural Area and Steppe Biodiversity". The fauna species given above under the forest biological diversity is also valid for many mountain ecosystems.

The Mediterranean Region covers more than 25 important mountains which have a high mountain ecosystem. This region is followed by the Irano-Turanian biogeographical region with 19 mountains and the Euro-Siberian biogeographical region with 11 valuable mountain ecosystems. Mountains provide habitats for birds, plants, economically important species, and wild species. The total number of species and endemic species present in most of these mountain ecosystems is unknown. The number of species and endemic species present most of these mountains is unknown. Bolkar Mountains, Amanos (Nur) Mountains, Munzur Mountains, Sultan Mountains, and Tecer Mountains are the known ones among those and the ecosystem of those mountains contain the most endemic plant species.

Since there are different ecosystems such as wetland, steppe, meadow-pasture and forest within mountain ecosystems, corporate responsibility in these ecosystems is not one-centered. For example, the management of forest pastures is carried out by the General Directorate of Forestry, while the management of other pastures is carried out by the Ministry of Agriculture and Forestry. Hence, those institutions which are directly or indirectly responsible for biodiversity are also responsible for mountain ecosystems.

F.1.7. Inland Waters Biodiversity

Turkey has important inland water ecosystems in terms of biodiversity with its rivers and lakes covering an area of approximately 10,000 km^2 (1,6% of Turkey's surface area). Turkey has 7 drainage basins including 25 river basins, and its groundwaters are estimated at 94 billion km^3. The average annual precipitation is around 640 mm and approximately one-third of this amount flows into water reserves

and contributes to the survival of wetlands. However, according to the annual amount of water per capita, Turkey is a country with a water shortage. The annual amount of water available per capita is around 1,500 m^3.

The inland water potential of Turkey consists of 33 rivers (177,714 km), 200 natural lakes (906,118 hectares), 159 dam reservoirs (342,377 hectares), and 750 ponds (15,500 hectares). 9 rivers longer than 500 km are Kızılırmak, Fırat, Sakarya, Murat, Aras, Seyhan, Dicle, Yeşilırmak, and Ceyhan.

Especially lakes have special importance in inland water ecosystems. Because many of our lakes are surrounded by mountains and they are under the influence of their environment, so their waters show more or less different characteristics. Waters of closed basin lakes are fresh, salty, or soda. The aquatic fauna elements of these lakes, most of which are isolated from each other, also differ as a result of blocking the gene flow of islets and flood the species. Many lakes accommodate rare and unique fish species. The largest of the natural lakes is Lake Van in the Eastern Anatolia Region, with a surface area of 374,000 hectares and with high salinity. There are some shallow salty lakes in the Central Anatolian Plateau, the largest of which is Lake Tuz (128,000 hectares). Lake Tuz almost desiccated almost completely in summer and the surface of the lake is covered with a 30 cm thick salt layer. Only salt-resistant vegetation grows around the lake.

Rivers are also sensitive ecosystems that separate natural habitats from each other. Valleys, caves, islets, and flood plains formed by streams are often a way for aquatic organisms to spread and sometimes a place to shelter. Some rivers in Anatolia have contributed to the diversity of aquatic fauna due to the effect of physical isolation.

Lakes, swamps, deltas, reeds, and mudflats are crucial for wildlife, especially for birds. More than half of the bird species in Turkey are migratory. Wetlands provide an important resting and wintering environment for water birds. Meriç, Gediz, Büyük Menderes and Küçük Menderes Deltas formed by the rivers flowing into the Aegean Sea and the Göksu, Seyhan and Ceyhan Deltas formed by the rivers flowing into the Mediterranean create habitats suitable for numerous species of water birds, especially as a result of the freezing of the lakes in Anatolia in winter. The delta formed by the Kızılırmak River flowing into the Black Sea is especially important for migratory birds that fly directly over the Black Sea.

F.1.8. Marine Biodiversity in Turkey

Turkey is a country consisting of two peninsulas (Anatolia and Thrace) and the length of the coast including the Turkish Straits System (Istanbul and Çanakkale Strait, Sea of Marmara) is approximately 8,592 km, excluding the islands. 2,083 km of coastline is under protection (24%). The different characteristics of the seas surrounding Turkey have a lead abundance of biodiversity in these seas. Approximately 3 thousand plant and animal species live on the coastline. A total of 472 fish species live in the seas of Turkey. Our total marine protected areas are 1,495,513 ha.

F.1.8.1. Marine Mammals in the Seas of Turkey

Marine mammals are one of the important groups of marine species groups in Turkish waters. There are 11 marine mammal species in Turkish waters. Although there are 21 marine mammal species that regularly or occasionally enter the Mediterranean, only 3 of them live in the Black Sea. It is also stated that Mediterranean Monk Seal (Monachus monachus) has not been seen in the Black Sea since 1994. Hunting of all marine mammals has been prohibited since 1983.

F.1.9. Islands and Island Biodiversity in Turkey

There are approximately 500 islands and islets within the national borders of our country. Most of the 212 islands and islets are located in the Aegean Sea. Some of the islands are rich in biodiversity and endemic species and some are isolated areas away from the human intervention that helps the preservation of both marine and terrestrial biodiversity and hosts endangered marine mammals such as the Mediterranean Monk Seal, seabirds, and amphibians by providing a habitat and breeding environment for many species.

Islands also have an important role in bird migration since they provide resting ground for migratory birds. A great number of birds stop over these islands each year. The Aegean Islands are living and breeding environments for the globally endangered Audouin's gull species (Larus audouinii). These islands provide nesting and living sites for Yelkouan shearwater (Puffinus yelkouan), Audouin's gull (Larus audouinii), Eleonora's falcon (Falco eleonorae), and Osprey (Pandion haliaetus). For these reasons, small islands are considered as priority areas for protection.

F.2. Studies on Biodiversity Conservation

F.2.1. Ex-situ Conservation

Turkey is one of the leading countries in the world in terms of biodiversity since that it has three biogeographic regions and these regions have transition zones and as as a result of the change in climatic and geographical features at short intervals because it being located as a bridge between the two continents and is the source of the wild ancestor of many plant and animal species in the world. In addition to these, there are many tree species, medicinal and aromatic plants, and industrial and ornamental plants that can be economically important in Turkey's vegetation cover. In this sense, Turkey is rich in biological diversity and plant genetic resources.

Ex-situ conservation studies in our country started in 1972 with the National Seed Gene Bank within the Aegean Agricultural Research Institute under the General Directorate of Agricultural Research and Policies to enable protection, long-term conservation, sustainability, use in scientific research and transfer to future generations of Turkey's plant genetic resources and continue with the Turkish Seed Gene Bank, opened in 2010 within the scope of the Field Crops Research Institute, and the Field Gene Banks, where the vegetative material is conserved.

The seed is carried out as long-term (basic collections) and short and medium-term (active collections) protection in the gene banks. Basic collections are stored in two sets at -18/-20 °C for a long time and active collections are stored at 0 °C for a medium-term. These collections include landraces, wild and herbaceous relatives (both in seed and the live plant collections), other wild plant species with economic importance (such as medicinal, aromatic, and ornamental plants), and endemic plant species. Seed samples forming base collections in the Gene Banks preserve its viability for 100 years, and seed samples forming active collections preserve for 30 years.

107,477 seed samples belonging to approximately 3,400 species are kept in the Seed Gene Banks. Moreover, 36,000 plant samples belonging to 145 families and 5,107 species are kept in the National GeneBank Herbarium, and these samples are gradually transferred to TAGEM Digital herbarium. 1,305 macro mushroom samples are stored with spore and micellar cultures in the National Gene Bank Fungarium.

Fruit, grapevine, and ornamental plant gene resources, which cannot be stored as seeds, and collections of mainly fruit species are preserved vegetatively in the field gene banks and.

There are approximately 9,500 living specimens belonging to 107 species in 18 Field Gene Banks within our Research Institutes, and 100,000 natural ornamental plants (geophytes) with bulbs and tubers of 900 species have been preserved and recorded in 6 Research Institutes.

Moreover, the practice of preserving plant species at extremely low temperatures for a long time was started with the ultracold preservation (Cryocontainment) laboratory established in 2007 within the National Seed Gene Bank. Here, the collections, which have problems in the storage of their seeds difficulties in long-term preservation in field gene banks, such as mint and garlic are prioritized.

Ex-situ conservation efforts for the forest trees (seed garden, origin trials, progeny trials) are carried out by the institutions affiliated to the Ministry of Agriculture and Forestry of the Republic of Turkey, especially by the Forest Tree Seeds and Tree Breeding Research Directorate. A total of 182 seed gardens have been established from 11 species, 20 seed plantations have been established from 16 species and a total of 23 clone parks have been established from 6 species so far.

Ex-situ conservation was initiated in 1995 with the protection of our cattle breeds, which are at risk of extinction, within the scope of the Project on "Conservation and Sustainable Utilization of Domestic Animal Genetic Resources", and 12 breeds including 4 cattle, 4 sheep, 1 goat, 2 chicken, and 1 bee breed and 2 silkworm lines are under protection in 7 research institutes today.

In-situ conservation was initiated in 2005 within the scope of the Project on "Conservation and Sustainable Utilization of Domestic Animal Genetic Resources", our cattle, sheep, goat, and bee breeds in 25 provinces, a total of 21 native breeds and 1 silkworm line, belonging to our breeders who are committed to breeding our silkworm lines purely, are under protection in farm condition.

The Project on "Nationwide Genetic Improvement of Small Ruminants in Farm Condition" was initiated in 2005 and continues as 171 sub-projects in 56 provinces as of today. The project is carried out on 21 sheep, and 6 goat breeds, and 1 million 100 thousand small ruminants' materials.

"Anatolian Water Buffalo Breeding Project" was initiated in 2011 and is implemented in 27,400 Anatolian buffaloes in 18 provinces.

The Biotechnology Centre and Genebank for Fisheries and Aquaculture is established in Trabzon to protect the genetic resources of fisheries.

National Food Starter Culture Gene Bank was established within the body of Bursa Central Research Institute of Food and Feed Control to determine, conserve and ensure the sustainability of our existing microorganism gene resources within the General Directorate of Agricultural Research and Policies. Primarily, studies on milk and dairy products have been started, and then other fermented products will be studied.

The semen, cell, DNA, egg, or embryos of the animal to be protected are kept by freezing with appropriate methods within the scope of the protection of animal genetic resources in gene banks. It is also possible to freeze and store blood or other animal tissues in the form of DNA segments of genes or genes belonging to the species, breeds or individuals to be protected.

In this context, 2 Gene Banks have been established in Lalahan Lalahan HMAE and TUBITAK Marmara Research to protect our Native Domestic Genetic resources. 88,484 genetic materials including 3,272 DNAs belonging to 18 small ruminants, 7 large ruminants and 5 horse breedings, 29,240 vial cells, 2,226 embryos, 53,746 Sperma were taken under protection.

F.2.2. In-situ Conservation

This is an approach that recognizes that species depend on the natural environment for their preservation and survival in their ecosystems. In-situ programs, such as National Parks, Nature Reserve Areas, Nature Parks, Wildlife Development Areas, Specially Protected Environment Areas, Natural Sites, Natural Assets, Gene Preservation and Management Areas (GPMA), have been carried out since the 1950s in Turkey. The ratio of protected areas of various statuses to the country area has increased from 4% to approximately 6% after 2000.

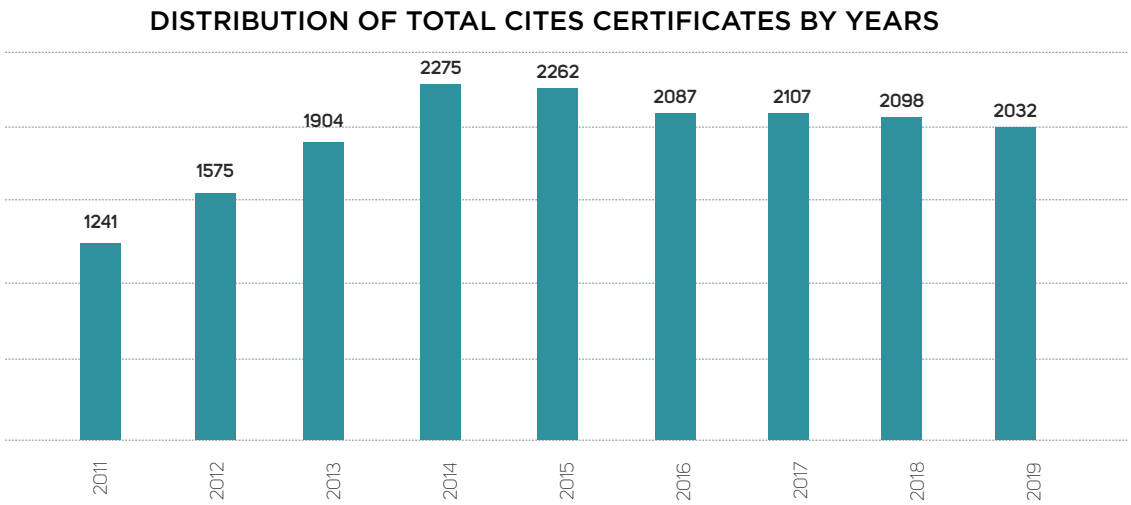
F.2.3. Studies carried out under CITES

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) entered into force on 01 March 1975 and Turkey became a party to the Convention on 22 December 1996. The 183 countries that have signed the contract have committed to comply with the obligations set out in this contract in the international trade (import, export, re-export, sea entry) of plant and animal species included in the lists of ANNEX-I, ANNEX-II, and ANNEX-III of the Convention. Within the scope of this contract, legislative regulations were made in our country and the By-Law on the Implementation of the Convention on the International Trade of Endangered Wild Animal and Plant Species was published in the Official Gazette No24623 dated 27. 12. 2001 and it revised after by being published in the Official Gazette No. 30837 dated 20.07.2019.

The CITES Management Authorities are the institutions that grant permit licenses. The Ministry of Agriculture and Forestry is the CITES Management Authority in Turkey. The General Directorate of Nature Conservation and National Parks is the Focal Point of the CITES Convention and ensures coordination between the Convention Secretariat and relevant institutions. Also, it carries out tasks such as reporting and training.

Following the provisions of the Convention; our country is in Category (A) because it has prepared National By-Law on Implementation of CITES under the Agreement within 5 years since it acceded, it is a Management and Scientific Authority, it has been controlling the trade by issuing a CITES Permit or Certificate for the species, and their parts and derivatives, listed in the CITES Annexes, it regularly submits annual and biennial reports on behalf of the Secretariat and conducts its implementations by the terms of the Agreement.

Graph 43 - Distribution of the numbers of CITES Documents Prepared by Years (Ministry of Agriculture and Forestry, 2020)



Some of the species that are smuggled are endemic species-specific to Turkey and therefore even more important. Customs and enforcement officers of the Ministry of Customs and Trade are trained on the importance of the matter through training sessions regularly held in Ankara to raise awareness on species and CITES applications to prevents illegal trafficking of species.

CITES Database System has been used since January 1, 2016. CITES Permits are issued electronically much faster through this database. (citesbasvuru. tarimorman.gov.tr) The system in question can be accessed via e-government. CITES Database is integrated into the ESW (Electronic Single Window System) of the Ministry of Commerce.

F.2.4. Studies carried out under the European Landscape Convention

The European Landscape Convention makes it possible to identify and evaluate ecological data representing biodiversity, biotopes, habitats, and landscape features in ecological planning and nature conservation studies, to reveal the status of the environment and the negative factors affecting the environment, and to carry out forward monitoring and evaluation studies.

Landscape Atlases are prepared for protecting, planning, and managing the landscape within the scope of the contract and they are very important as they will guide all decision-makers and form an ecological base.

The convention is implemented by "the Steering Committee for Culture, Heritage and Landscape (CDCPP)" and 39 countries have become parties to the convention so far. The convention is the first international agreement that addressed the landscapes in Europe with all their properties. The convention does include not only the landscapes with outstanding features but also the ordinary and damaged landscapes. The Ministry of Agriculture and Forestry is the focal point of the contract and updates the national biennial reports report it prepares and submits to the Council of Europe Secretariat.

Making a national landscape inventory, defining and classifying the landscape, determining the protection and development strategies are necessary to fulfill the conventional obligations and to transfer the rich natural and cultural landscape diversity and heritage values of our country to future generations. The Project studies, initiated locally in Konya for this purpose and proceeded to provincial scale in Malatya, have been transferred to the basin scale with the landscape atlas preparation studies. In this context, the "Büyük Menderes Basin Landscape Atlas" Project was carried out between 2018-2021.

Studies have been initiated to extend the "Basin Landscape Atlas" projects to other basins. The method used in the preparation of the Yeşilırmak Basin landscape atlas is also used in this project.

The project includes the preparation of a 1/100,000 scaled landscape atlas (GIS) in the environment, determination of the activities to be conducted for the management of all kinds of relational database information and data, and the establishment of the landscape information system.

Landscape character types and landscape character areas, landscape diversity and biodiversity, and landscape quality of the basin will be specified, ecologically sensitive areas, areas to be protected and repaired, ecological corridors, connection corridors will be determined, and ecologically sensitive micro catchments will be identified for each sector through the project. Moreover, spatial targets, landscape quality targets, landscape management targets will be set for micro catchments and sectoral landscape guides will be prepared by determining the landscape protection and development strategies.

The micro catchments that are problematic in terms of discharge (domestic and industrial) points in the basin and those that are problematic in terms of the solid waste landfill, as well as the water pollution and pressure situation are revealed, the evaluations of the micro catchments are conducted in terms of diffuse pollutants based on the amount of nitrogen and phosphorus transmitted to rivers, and the pressure of HPP (hydroelectric power plants) on the micro catchments, areas with settlement pressure on agricultural lands, environmental problems caused by a stone, sand, and mines, etc. are determined and suggestions are made within the landscape atlas studies.

2024 goals include extending the Basin Landscape Atlas to the other basins representing each geographic region. Preparations relevant to the "National Landscape Strategy and Action Plan" will be initiated after the extending projects are completed. Horizontal and vertical integration must be provided, as stated in the published guidelines for the implementation of the European Landscape Convention to formulate the national landscape policies as soon as possible.

F.2.5. Studies on Species Conservation

It is planned to prepare at least 10 Species Action Plans every year as of 2013, and it is aimed to complete 100 Species Action Plans by 2023 within the scope of the 2013-2017strategic objectives of the Ministry of Agriculture and Forestry. In this framework, the developing process of the Action Plan initiated in 2013, the action plan for 98 species was completed at the end of 2019 and the studies are in progress for the remaining 2 species. 5-year monitoring studies of the species whose species action plans have been completed are ongoing within the framework of the plan.

Living groups such as mammals, birds, reptiles and amphibians, plants were taken into account while prioritizing the species for conservation. In this context, endangered species were evaluated on three different scales. These are conservation studies at the national, regional (or ecosystem scale), and provincial scale. Furthermore, subjects such as IUCN red list status, Bern Convention supplementary lists, national conservation status, population status, population trends, hunting - fishing - gathering pressure, industrialization pressure, pressures arising from agricultural activities, tourism pressure, institutional technical capacity, budget, awareness level, current conservational condition of the species, inter-institutional coordination are among the criteria also taken into account in the prioritization of species in conservation.

F.2.6. Other Studies

F.2.6.1. The National Biodiversity Coordination Board

The United Nations Convention on Biological Diversity was approved by our country with Law No. 4177 published in the Official Gazette No. 22746 dated 03/09/1996. The Ministry of Agriculture and Forestry, General Directorate of Nature Conservation and National Parks is the focal point of the UN Convention and renders the national coordination services.

UN Conference on Biological Diversity, composed of the meetings and events relevant to the 16th Conference of the Parties of the Convention, will be held in our country in the last quarter of 2022 and the term presidency of the Convention will be carried out by our country between 2022 and 2024.

The National Biodiversity Coordination Board was established under the presidency of the Minister of Agriculture and Forestry with the Presidential Circular No. 2019/15 published in the Official Gazette No. 30850 dated 2 August 2019, to follow the developments in the global biodiversity agenda, gaining the biodiversity to the economy sustainably, executing of the Convention, and hold the term presidency effectively.

The General Directorate of Nature Conservation and National Parks was assigned to the Secretariat of the Board under the Ministry Circular No. 2019/7 dated 22 August 2019 on the Execution of the Secretariat Services of the National Biodiversity Coordination Board prepared for the implementation of the aforementioned Presidential Circular.

The 1st Meeting of the National Biological Diversity Coordination Board was held on 26.02.2020 under the Presidency of the Minister of Agriculture and Forestry, and thanks to this Board, the waste of resources caused by repetitive studies will be prevented by eliminating the lack of coordination between institutions, the biological diversity will provide great added value to the national economy and will also be represented effectively in the arena.

F.2.6.2. The National Biodiversity Inventory and Monitoring Project

The National Biodiversity Inventory and Monitoring Project (UBENİS) was prepared by the Ministry of Agriculture and Forestry to reveal and conserve our biological diversity and it was carried out between 2013-2019. Biodiversity inventory studies were completed in 81 provinces and the Biological Diversity Map of our country has been created.

Biodiversity inventory studies of our country conducted within the scope of the project are as follows;

- Vascular plants,
- Mammals,
- Birds,
- Fishes,
- Reptiles,
- Literature review and field surveys for amphibians,
- Only literature review for seedless plants.
- Seedless has been carried out for invertebrates.

Biodiversity inventory data obtained from all provinces of our country have been entered and stored in Noah's Ark National Biodiversity Database. Thus, the biological diversity data of our country can be queried based on tables, graphs, and maps through a database, and the changes that will occur for the protection and sustainability of our biological diversity can be observed.

The importance of UBENIS;

- There has not been such kind of a countrywide flora (plant existence) determination study based on area and point since the work of Flora of Turkey, obtained by the study conducted by P.H. Davis in our country.
- It is the only study in our country that countrywide field surveys and literature reviews have been conducted on vascular plants, birds, inland water fish, mammals, reptiles, and amphibians.
- Our country will be able to be integrated into the European Habitat classification system using EUNIS (The European Nature Information System) Habitat Types for the first time. Integrated habitat types are of great importance in the accession process to the European Union.
- All species lists of vascular plants, birds, inland water fish, mammals, reptiles, and amphibians living groups in our country will be obtained.

Monitoring indicators were determined for each study subject taxon and its habitat, and a monitoring plan was prepared for each monitoring indicator within the scope of the project. In line with these plans, the population status of the species, changes in the status of the ecosystem that the species belongs to and represents are followed by monitoring the indicators.

Monitoring studies based on the species and specific areas are carried out in 81 provinces, of which project activities were completed, by both the personnel working in the relevant Regional Directorates and by the academicians through the protocol signed with the universities as of 2020.

F.2.6.3. Project on Struggling with Bio-Smuggling

Countries with rich biodiversities, such as our country, are exposed to bio-smuggling especially in terms of genetic resources. The most important issue here is that our biological resources, which are the subject of bio-smuggling cases, have the characteristics of being "genetic resources".

Bio-smuggling cases are particularly centered upon the Eastern Black Sea, Southeastern, and Eastern Anatolia and Mediterranean regions. tuberous and bulbous plant species - mainly orchid (salep) species-, wild wheat, butterflies and other insect species, viper species, and salamander species have been identified in the bio-smuggling cases encountered during the last five years.

"Determining and implementing measures for the unauthorized and uncontrolled collection of biological resources and their expulsion (bio-smuggling)" is included as a strategic action under the 3rd objective, the 2nd goal of the National Biodiversity Strategies and Action Plans (NBSAPs).

The " Project on Struggling with Bio-Smuggling" was initiated by the Ministry of Agriculture and Forestry in 2013 and expanded to 81 provinces in 2015. The implications of this project continue and training workings on struggling with bio-smuggling are carried out to protect our genetic resources.

Although there are various legal regulations that serve for struggling with bio-smuggling under the jurisdiction of the Ministry of Agriculture and Forestry and relevant institutions, the Draft Law on the Protection of Nature and Biological Diversity includes legal regulations regarding the judicial penalties to be applied in cases of bio-smuggling especially due to the insufficient sanctions against foreigners.

F.2.6.4. Project on Determining the Plant Species That Will Submerge Dam Water Mirror (Reservoir)

The Project on Determining the Plant Species That Will Submerge Dam Water Mirror (Reservoir) was carried out between 2013-2015. The plants that will be submerged under the dam waters throughout the country are aimed to be determined, cultivated, and transferred to the suitable habitats before water-holding through the project within the framework of the protocol signed between the General Directorate of Nature Conservation and National Parks, General Directorate of Forestry, General Directorate of Combating Desertification and Erosion, and the General Directorate of State Hydraulic Works.

A total of 4,280 plant species were identified as a result of the project. 62 species of these, have been determined as featured plant species that are deemed suitable for production, transfer/transportation.

Specific plant species, determined to be submerged after the impoundment of the dam water mirror, were directly transported/transferred to suitable habitats as a result of the project activities. Moreover, the seedlings produced from the production materials picked in the field survey of specific plants were planted in the appropriate habitats.

Insitu conservation studies are supported through the planting of seedlings produced for species with weak signs of life in their new habitat. The seeds of the specific plants, which were picked in the project's survey field to support the ex-situ (protection outside the habitat) studies of the specific plants, have been taken under protection by delivering to the Turkish Seed Gene Bank. It is aimed to disseminate the results by monitoring the success of adaptation in the new habitats of the species identified as specific plants.

F.2.6.5. Project on Recording the Traditional Knowledge on Biodiversity

Our country, as a country providing genetic resources, should compile and record the traditional information related to genetic resources to protect its economic and social rights on traditional information related to genetic resources. In this context, it is aimed to compile knowledge on the traditional products such as medicines, yeast, and dyes developed by the public using natural biological resources and to create a national traditional information bank through the "Project on Recording the Traditional Knowledge on Biodiversity" initiated by the Ministry of Agriculture and Forestry in 2017.

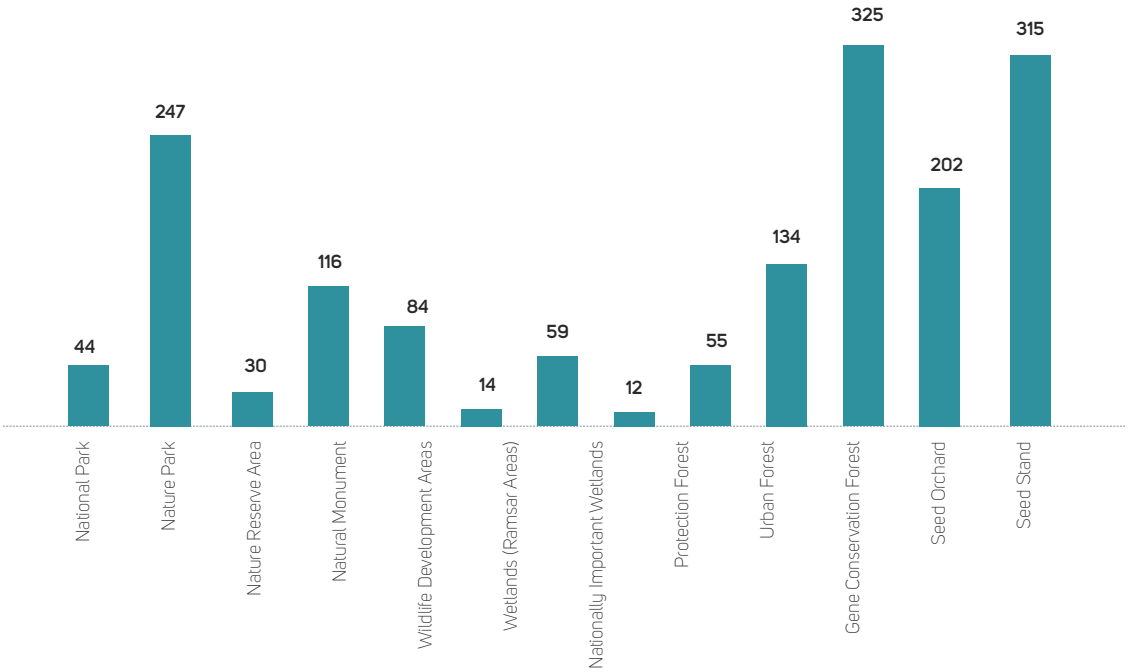
As a result of the project; the traditional information database will be accessed by the international patent experts, and the products developed by using traditional knowledge biodiversity of our country will be prevented from being patented by foreigners. Moreover, this information in the database will be accessed by the academicians and researchers to be used in research and development activities. Field surveys of the project were completed in 12 provinces in the 2017-2019 period, and the surveys in the remaining provinces are planned to be completed until 2023.

F.3. Protected Areas

A protected area is a land, water, or sea area with a conservation status managed under the relevant legislation to protect and maintain biological diversity, natural and related cultural resources.

Protection activities in Turkey have been carried out in the areas of different statuses such as specially protected environment area, national park, nature park, nature reserve area, nature monument, wildlife development area, protection forests, seed stands, seed gardens, and gene protection areas, agricultural enterprises, natural and archaeological sites, wetlands and biosphere reserves.

Graph 44 – The Number of Protected Areas under the responsibility of the Ministry of Agriculture and Forestry
(Ministry of Agriculture and Forestry, 2020)



It is important to protect biodiversity and manage the areas with a sustainability approach by ensuring inter-sectoral coordination with an integrated area management approach and multi-faceted perspective in protected areas that have natural, historical, and cultural values across the world and country but under the pressure of urbanization, tourism and agriculture.

Conservation and monitoring of species and habitats, which are important components of biodiversity in protected areas, is important in terms of preserving the continuity of ecosystem services by protecting their existing populations, as well as for the management of protected areas.

Protection activities in Turkey have been carried out in the areas of different statuses such as specially protected environment area, national park, nature park, nature conservation area, nature monument, wildlife development area, protection forests, seed stands, seed gardens, and gene protection areas, agricultural enterprises, natural and archaeological sites, wetlands and biosphere reserves.

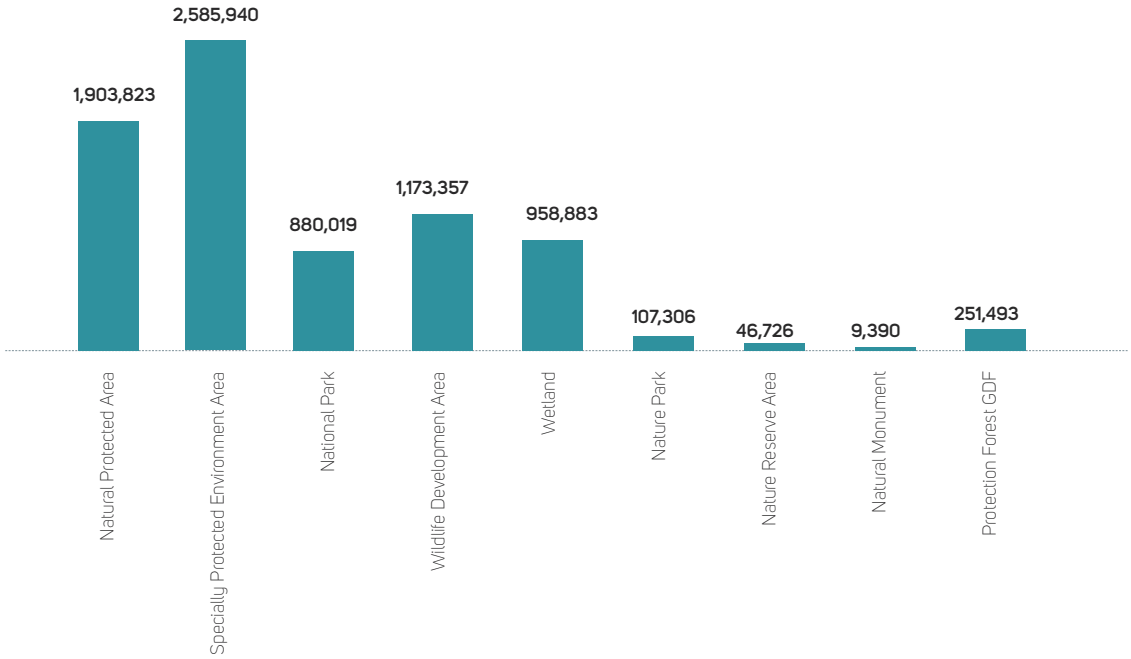
Natural Protected Areas, Specially Protected Environment Areas, National Parks, Wildlife Development Areas, Wetlands, Nature Park, Nature Reserve Areas, Forestry and Natural Monuments constitute the Protected Areas in Turkey.

The total area of the Protected Areas in Turkey is 7,916,937 hectares (Table 88).

Table 88 – Surface Areas of Protected Areas in Turkey
(Ministry of Environment and Urbanization, Ministry of Agriculture and Forestry, 2020)

PROTECTED AREA	SURFACE AREA (ha)
Natural Protected Area	1,903,823
Specially Protected Environment Areas	2,585,940
National Park	880,019
Wildlife Development Area	1,173,357
Wetland	958,883
Nature Park	107,306
Nature Reserve Area	46,726
Natural Monument	9,390
Protection Forest	251,493
TOTAL	7,916,937

Graph 45 - Surface Areas of Protected Areas in Turkey (ha)
(Ministry of Environment and Urbanization, Ministry of Agriculture and Forestry, 2020)



There are 18 Specially Protected Areas in Turkey and the surface area of these regions is 2,585,940 hectares. There are 2,554 natural protected areas in Turkey and the surface area of these areas is 1,903,823 hectares. The total area of Specially Protected Environment Areas corresponds to 3% that of Turkey, and the total area of Natural Protected Areas corresponds to 2% that of Turkey.

F.3.1 Specially Protected Environment Areas

Efforts for the protection of biodiversity in the Mediterranean, aiming at international cooperation in the field of regional conservation areas, was initiated within the framework of "Protocol Concerning Specially Protected Areas in the Mediterranean" which is an annex of the "Convention for Protection of the Mediterranean Sea against Pollution" signed in Barcelona on 16.02.1976 and published in the Official Gazette No. 17368 dated 12.06.1981.

Currently, the Specially Protected Environment Areas are announced by Article 109 of the Presidential Decree No. 1, Article 9 of the Environment Law, the Decree-Law No. 383, and the By-Law on Procedures and Principles of Determination, Registration, and Approval of Protected Areas. There are 18 Specially Protected Environment Areas in Turkey and the surface area of these is 2,585,940 hectares.

There were 16 Specially Protected Environment Areas in Turkey and the surface area of these was 2,458,749 hectares in 2015, while the number of Special Environmental Protection Areas has increased to 18, and the surface area of these areas has increased to 2,585,940 hectares.

F.3.1.1. Belek Specially Protected Environment Area

Belek Specially Protected Environment Area has a 29 km coastal area formed by coastal dunes. Wide dune and forest areas with regional characteristics make the area very rich in terms of biodiversity. Endemic fish species Aphanius anatoliae, endemic Serik pear (Pyrus serikensis), Caretta caretta, and Chelonia mydas sea turtle species are among the riches of the region.

556 seed plant taxa, 53 seedless plant taxa, 57 large and small mammal taxa, 245 bird species, 273 marine/inland flora and fauna taxons, 25 reptile taxa, 4 amphibian taxa, and 248 invertebrate taxa, new recoded 50 seed plants and 90 invertebrate taxa have been identified under the Biological Diversity Research Project in Belek Specially Protected Environment Area, completed in 2019.

F.3.1.2. Datça- Bozburun Specially Protected Environment Area

Datça- Bozburun Specially Protected Environment Area is especially rich in vegetation cover. Olive trees, Turkish pine groups, endemic Cretan date palm (Phoenis theophrast), almond trees, local thymes, oleander, bay laurel, and locusts reflect the characteristics of typical Mediterranean vegetation cover. 807 species of marine flora and fauna, 1,047 taxons of flora, 167 species of terrestrial invertebrate, 110 fish species, 4 amphibian species, 27 reptile species, and 123 bird and mammal species have been specified in this areas.

The peninsula is defined as an archeological site including areas that need to be protected as they are the products of various civilizations from history to the present and they are archaeological, urban, natural, historical, etc. areas that represent the social, economic, architectural, and similar characteristics of the periods they lived. These areas are scattered on the peninsula.

F.3.1.3. Foça Specially Protected Environment Area

Foça has been declared as a Specially Protected Environment Area to protect natural and historical wealth. Foça is a well-known area for the Mediterranean Monk Seal (Monachus monachus), which is one of the endangered species. The vegetation cover of the area consists of pine trees and maquis and it provides habitats for wolves, foxes, jackals, martens, partridges, pigeons, and quails. Gediz Delta, located in Foça SPEA, is very rich in fish species and is a frequent destination for migratory birds.

The uninhabited peninsulas (İngiliz and Fener Cape etc.) that form the shores of Foça are protected areas due to being the silhouette of Foça as natural extensions to the sea and its environmental values. İncir, Fener, Eşşek, Hayırsız, Orak Islands and Siren Rocks also decorate these bays.

F.3.1.4. Gökova Specially Protected Environment Area

Gökova Specially Protected Environment Area is an ecologically important region with its rich flora and fauna, and its vegetation cover reflects the characteristics of both the Aegean and the Mediterranean Region. Boncuk Cove is the breeding ground of sand sharks (carcharinus plumbeus) and Akyaka Kadın Creek is the feeding and breeding ground for Eurasian otter (Lutra lutra). Additionally, the area is the habitat of the Audouin's gull (larus audoinii), Mediterranean monk seal (monachus monachus), and European shag (phalacrocorax aristotelis) species.

Another important area in the region is Sedir Island, known as Ketra, Setra, Sedir, or Şehirlioğlu Island. The island is located in the southern part of the Gokova Bay and contains inscriptions from Hellenistic and Roman times.

The area is also quite rich in fauna. Winged animal species are distributed all over the area and these include turtle dove, quails, partridge, cormorant, heron, Eurasian nightjar, swallow, woodpecker, starling, ouzel, reed bunting, crow, kite, black francolin, mallard, greylag goose, tree sparrow, eagle, hawk, accipiter and owl.

F.3.1.5. Gölbaşı Specially Protected Environment Area

Mogan-Eymir Lakes and wetlands are one of the important bird areas used by birds for shelter, breeding, and accommodation and nominated for Ramsar in our country. 83 different bird species have been specified in the area. In addition to this, 3 amphibian species, 25 mammal species, 12 reptile species, 13 fish species, and 493 plant species live in the areas and 47 of the plant species are endemic. Chives or Cornflower (Centaurea tchihatcheffii), one of the plant species that characterize the area, is distributed over a limited part of the area.

"Wetlands-Marshlands" in the area are the cradle of living species and diversity, providing the water and primary production to which countless plant and animal species can survive. Therefore, the area is strategically important for various organisms to survive. Mogan-Eymir Lakes and wetland-marshland areas are one of the important bird areas used by 227 bird species for shelter, breeding, and accommodation and nominated for Ramsar in our country. 40 of these bird species breed in the region, 30 of them are observed all year round, the others are seen during migration periods or only around the lake.

F.3.1.6. Fethiye- Göcek Specially Protected Environment Area

One of the breeding grounds of the Caretta caretta and Chelonia mydas species protected by the Bern Convention and CITES is Fethiye Beach. Fethiye-Göcek SPEA is one of the endemic plant species of the sweetgum tree (Liquidambar Orientalis) that grows in creeks, deltas, and places whereground water is high. The sweetgum oil obtained from sweetgum tree is used in the cosmetics and pharmaceutical industry.

The important herb species of the area are caterpillar-plant, thistle, efek, reed canary grass, couch, nutgrass, wormseed, Avena fatua, pennyroyal, berberis, horsemint, sage, salep, bağdibi, blackthorn, gum thistle, eryngo.

Most of the arable land in Muğla Province is in the Fethiye district. The district center is surrounded by very fertile 1st class land convenient for irrigated agriculture.

F.3.1.7. Kaş- Kekova Specially Protected Environment Area

Kekova, which gave its name to the region, is the largest island in the region. Kekova Island lies in the sea by forming a straight adhering to the Anatolian side. 187 genera are belonging to 51 families and 272 species belonging to these genera and plant species from subspecies and 26 of these species are endemic. Additionally, there are 20 mammal species, 96 bird species, 16 reptile species, and 4 amphibian species. The plant species Daucus Conchita W. Greuter (Wild Carrot-endemic) and Onopordum rhodense have been first identified in Turkey.

447 seed plant taxa and 116 seedless plant taxa, 70 large and small mammal taxa, 141 bird species, 968 marine/inland flora and fauna taxa, 23 reptile species - 5 amphibian species, and 229 invertebrate taxa, 289 new record taxa have been specified under the Project: Kaş-Kekova Specially Protected Environment Area Biodiversity Research. 163 of these are plants, 43 of them are birds, 2 of them are marine fauna and 81 of them are invertebrate taxa.

11 sensitive habitats, 1 of which received a proposal, have been specified in the light of the literature reviews and field surveys conducted within the scope of the project in Kaş-Kekova SPEA, where 15 EUNIS habitat types have been identified. However, it has been determined under the evaluations made within the scope of Habitat Directive that 15 of the habitats specified in KaşKekova Specially Protected Environment Area are included in the Habitat Directive Annex-I list and are among the habitats that need to be protected/sustained. It has been determined, as a result of the evaluations made within the scope of the Birds Directive, that 59 bird species are included in the additional lists of the Birds Directive.

İç Island, Toprak Island, Aşırlı Island and Kişnali Island are other important islands in the area. Sıcak Peninsula and Kekova Island lie parallel to the coast and from Ölüdeniz, which has the characteristics of an inland sea.

The richness of ancient and historical artifacts as well as its natural beauties, also makes the area attractive in terms of archeology tourism.

F.3.1.8. Göksu Deltası Specially Protected Environment Area

Göksu Delta is also a Ramsar area and is an important wetland for numerous migratory birds. Göksu Delta is one of the main nesting grounds in the Mediterranean where sea turtles "Caretta caretta" and "Chelonia mydas" lay their eggs. It is also one of the nesting grounds of the Nile softshell turtle (Trionyx triunguis). There are 507 plant taxons in the Göksu Delta Specially Protected Environment Area, 10 of which are endemic taxa.

It is observed that the Göksu Delta is dominated by halophytes and dune vegetation. Especially the species belonging to Salicornia and Euphorbia genera is observed to be concentrated in the west of the Delta and neighborhood of Akgöl and Paradeniz. The existence of aquatic plants in the Göksu Delta depends on the water regime and salinity of the lagoons.

A large number of bird species that use the Göksu Delta as a wintering and incubation area contribute to the formation of an interesting and lively landscape in almost every season of the year.

F.3.1.9. Pamukkale Specially Protected Environment Area

Thermal springs, which are one of the important natural resources in the region and constitute Pamukkale Travertines, have affected a wide area and in this context, there are 17 hot springs with temperatures varying between 35-100°C.

Map 18 – Specially Protected Environment Areas in Turkey
(Ministry of Environment and Urbanization, 2020)

There are two main soil groups in the area, namely brown forest soil and colluvial soil and natural vegetation cover is mostly seen on the banks of streams, the borderlines between the agricultural areas, groves, pastures, and the hills that are not suitable for agriculture. There are visible natural mass greens, Nerium oleander (oleander) and Ficus Inur and Vitex Agnus Castus groups, on the Hierapolis plateau plain. Some species of herbaceous plants reveal themselves with their temporary leaf-flower color effects depending on the seasons.

F.3.1.10. Ihlara Specially Protected Environment Area

Ihlara Specially Protected Environment Area is a very rich area in terms of biodiversity. 364 taxons consisting of 54 families and 218 genera have been specified as a result of the researches carried out in Ihlara Valley. The fact that the inside of the valley is not under heavy grazing and the shadow areas are high has caused the number of species to be high. The fact that 43 of these species are endemic plant species reveals the importance of the natural vegetation cover of the area. Apart from these, the area is rich in hot thermal springs and historical ruins.

According to the results of researches and observations, 35 bird species from 21 families have been specified in the area. 11 of these bird species use the area as an incubation ground. Additionally, 4 fish species have been specified in Melendiz River which is the most important river in the area. The most hunted and economically valuable species is the European chub (Leuciscus cephalus) whose local name is "Pullu".

F.3.1.11. Köyceğiz- Dalyan Specially Protected Environment Area

İztuzu beach in the area is one of the most important breeding grounds for sea turtles (Caretta caretta and Chelonia mydas) and Nile softshell turtle (Trionyx triunguis). Moreover, the area is the breeding and habitat area of the sea otter species (Lutra lutra).126 bird species, 282 marine fauna, and flora species have been specified in the area.

The most dominant vegetation in Köyceğiz Specially Protected Environment Area consists of Turkish pine and sweetgum forests, shrub and shrub plants belonging to maquis and frigana, as well as herbaceous plants growing in the wetlands and barren marshes around Köyceğiz Lake.

The neighborhood of the lake, canals, and forests have big potentials as breeding and sheltering ground for various species.

Wild goose, white stork, İzmir kingfisher, swallow, marsh warbler, gull-billed tern, short-toed eagle, bee-eater, seagull, glossy ibis, little egret and other bird species use the area as wintering, and incubation ground.

F.3.1.12. Lake Tuz Specially Protected Environment Area

The lake is the second-largest in Turkey and the second saltiest lake in the world. It is on the Temporary List of World Natural Heritage Sites.

The Lake Tuz basin is a class A wetland according to international criteria, which is of great importance in terms of protecting biodiversity in our country. Endemic plant species not seen in other parts of the world have been identified in the Lake Tuz Specially Protected Environment Area. Unlike other regions, the endemic plants of Tuz Gölü contain races resistant to salt and drought.

These areas are invaluable genetic resources in our rapidly getting dry and barren world. Many new record plant species have been specified in the area. These are VU (Vulnerable) species according to IUCN categories and are also protected under the Bern Convention.

- It's determined by the studies carried out within the scope of the Lake Tuz Specially Protected Environment Area Biological Diversity Research Project that Lake Tuz has very special and important habitats in terms of biological diversity.
- 71 endemic plant species, not seen in other parts of the world, have been specified in the area under the project. Unlike the other areas, the endemic plants of Lake Tuz contain salt-resistant and drought-resistant races. These species are an invaluable genetic resource in our increasingly arid and barren world.
- Eight of the 226 plant species identified in the area are new records. Two of these eight species are VU (Vulnerable) species according to IUCN categories, and one species is under Bern Convention protection.
- A total of 48 fauna species, comprised of 41 invertebrates, three aquatic benthic macroinvertebrates, one fish, one reptile, and two mammals have been recorded in the same area for the first time.

Picture 2 – Lake Tuz

F.3.1.13. Uzungöl Specially Protected Environment Area

Uzungöl Specially Protected Environment Area shelters various wild animal species such as bears, wolves, wild goats, foxes, Caucasian black grouses in the mountains. 658 plant taxons including 125 subspecies and 68 varieties, 90 mammal species, 8 amphibian species, 7 reptile species, and 250 bird species live in the area. One of the plant species, Primrose (Primula x uzungolensis) has first been identified in this area.

Considering the wildlife, various animal species such as bear, wolf, wild goat, fox, Caucasian mountain rooster shelter in the mountains around Uzungöl.

Although the water surface of the lake varies slightly depending on the amount of water flow in the season, the lake is generally 1,000 meters in length, 500 meters in width, and 15 meters in depth. Trout lives in the lake.

Haldizen creek valley, which lies towards the south, holds great natural beauties. About 10 small lakes located at the heights of the mountains at a distance of about 10 to 20 km from Uzungöl increase the richness of activity in the region.

F.3.1.14. Saros Gulf Specially Protected Environment Area

Saros Gulf is considered as a large and natural aquarium by marine biologists and diving enthusiasts due to the rich variety of fish it contains. During his visit to Turkey in the 1970s with his ship "Calipso", Captain Cousteau dived in the gulf and defined the area as "Northern version of the Red Sea".

Saros Gulf and its coasts have been declared as a Specially Protected Environment Area to protect their geomorphological, landscape, ecological, floristic, biogenetic, and touristic features without deterioration.

Mediterranean climate is dominant in the gulf area. The highest point in the basin is Koru Mountain (385 m) which is on the Northern/North-eastern edge of the gulf. The only river that provides water to the basin is Kavak Creek.

Complicated whirlpool formations occur in the waters of Saros Gulf which is one of the saltiest parts of the Aegean Sea. The gulf is a self-cleaning one due to these flows with whirlpools.

F.3.1.15. Patara Specially Protected Environment Area

Patara Specially Protected Environment Area is composed of Muğla and Antalya provinces, Fethiye and Kaş districts and 5 sub-districts, and 4 villages affiliated to them. Patara, which is located within the borders of Gelemiş village in Kaş district of Antalya province, is the ancient city of the Lycian Civilization. Additionally, the area is an important nesting ground for sea turtles.

The economy of the area generally depends on agriculture and tourism has started to develop in recent years. Modern agricultural activities have started around Ova Lake and greenhouse cultivation is widespread in the area. Early season vegetables and fruit are also cultivated in the area.

The wet line on Patara Beach has a length of 7 km from the edge of Eşen Stream to the east and at 25 m length and the line consists of very fine clean sands. This area is a 1st - degree spawning ground for the Mediterranean Sea turtle species Caretta caretta and Chelonia mydas. The density of turtle nests was determined to be between 2-19 nests/km according to the results of the "Sea Turtles Research Project" conducted in 1992 in cooperation with the Presidency of the Environmental Protection Agency for Special Areas and Dokuz Eylül University.

In administrative terms, a large part of Patara Specially Protected Environment Area is located within the borders of Antalya-Kaş district and the other part is within the borders of Muğla-Fethiye district.

According to archaeological researches carried out in the area, Patara is one of the oldest cities of the Lycian civilization and it was the main port of the period in 9th BC. It was established on a triangular-shaped plain on the west of Erendağı in Kalkan throughout history.

- A total of 373 seeded plant species in species and subspecies categories belonging to 74 families have been specified as a result of the studies carried out within the scope of the Patara Specially Protected Environment Area Biological Diversity Research Project. 343 species of 373 seed plant species are new records, and it has been identified for the first time in the areas through this study. 16 endemic species have been specified in the area.
- A total of 261 fauna species, including 107 terrestrial invertebrates, 11 aquatic benthic macroinvertebrates, 13 fish, 29 amphibians and reptiles, 76 birds, and 25 mammals, have been identified in the area. Six of the identified species are endemic.
- A total of 125 fauna species, including 81 terrestrial invertebrates, four aquatic benthic macroinvertebrates, nine fish, 23 reptiles, and eight mammals, have been recorded for the first time in the area.

F.3.1.16. Finike Seamounts Specially Protected Environment Area

Finike Seamounts Specially Protected Environment Area which was announced by the Decree of the Council of Ministers and published in the Official Gazette No. 28737 dated 16 August 2013, is the first protected area in the marine area of our country.

Finike Seamounts Specially Protected Environment Area, which is added to 15 other specially protected environment area on the Aegean and Mediterranean coasts and various regions of the Anatolia in Turkey and includes a marine protected area of 1,124,173 ha and it is of great importance in terms of deep-sea biodiversity, rare banks, special ecosystems like seamounts, endangered species and rare ecosystems.

Map 19 - Finike Seamounts Specially Protected Environment Area
(Ministry of Environment and Urbanization, 2020)

Moreover, the area in question is expected to help the realization of the Aichi Goals set out under the Convention on Biological Diversity, for improving the condition of the Mediterranean Marine Protected Areas and ensuring their management, and to fulfill the country obligations arising from the Barcelona Convention, GFCM (The General Fisheries Commission for the Mediterranean) and Bern conventions.

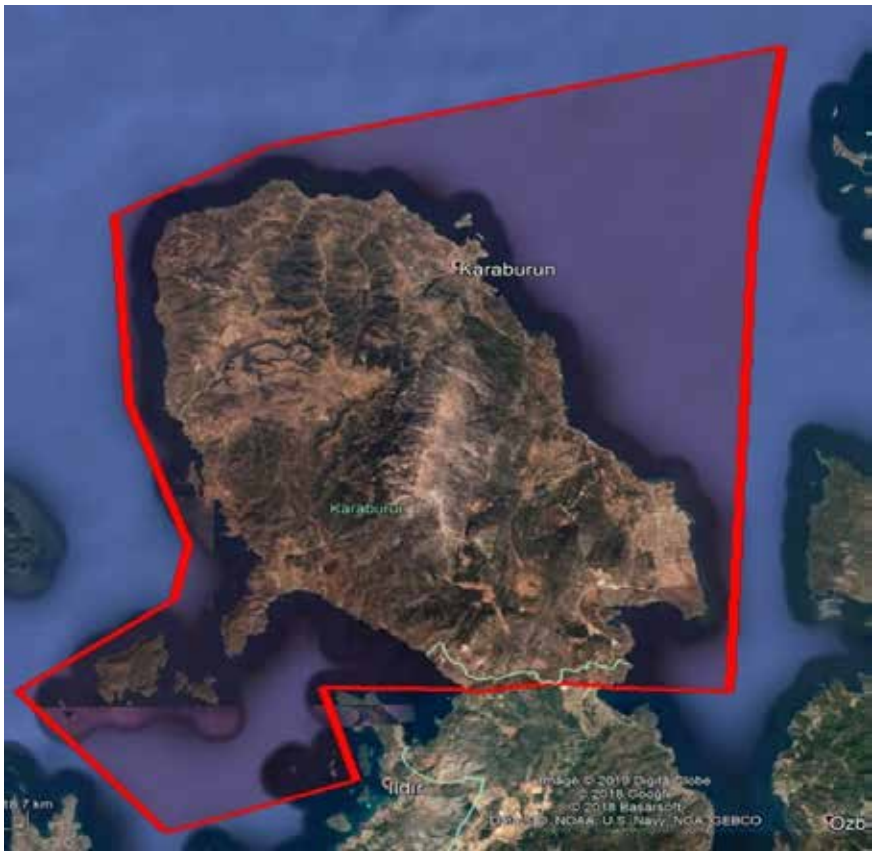
F.3.1.17. Karaburun-Ildır Gulf Specially Protected Environment Area

Karaburun-Ildır Gulf Specially Protected Environment Area was determined and declared as a Specially Protected Environment Area with the President's Decree No. 823, dated 14.03.2019, and was published in the Official Gazette No. 30715 dated 15.03.2019.

Karaburun-Ildır Gulf Specially Protected Environment Area includes İzmir province, Karaburun Peninsula, Ildır Gulf marine areas, and islands. Karaburun-Ildır Gulf Specially Protected Environment Area is a total area of 946,57 km^2, of which the terrestrial area (including lakes) is 435,93 km^2 and the marine area is 510,64 km^2.

The destruction of the Turkish pine communities of the Karaburun Peninsula pave the way for the formation of the maquis, and the destruction of this formation paved the way for the formation of the frigana. The vegetation cover is generally composed of the maquis in the Karaburun Peninsula. Turkish pine is the dominant tree species of forest vegetation is (pinus brutia) (approximately 27,000 ha of Turkish pine forest), kermes oak (Quercus coccifera) is the type of tree that can be found in every area of the maquis formation and thorny burnet (sarcopoterium spinosum) and various types of ladens (cistus sp.) are the species that can be seen in almost every area of Garig formation.

Map 20 - Karaburun-Ildır Gulf Specially Protected Environment Area (Ministry of Environment and Urbanization, 2020)



Although there are some regional variations, the species that make up the vegetation are mostly Italian ryegrass, arbutus, sandalwood, terebinth, kermes oak, Staphylea, white birch maple tree, mastic, wild strawberry, carob, laurel, agave, capers, broom, sunflower, alkanna orientalis, onosma bornmuelleri, mercurialis annua, clover, caterpillar-plant, wild onion, dede derneği, fabaceae, muscari muscarim, and alçak esme. On the other hand, the most common frigana species are thorny burnet, various ladens, erica arborea, pink star (Erica tetralix).

15 endemic species, 4 rare species, and 5 species have been specified in the flora of the peninsula within the scope of CITES. Again, in addition to these species, 21 species have been identified that are in the IUCN category, although they are outside these species. Furthermore, 76 species of medical, 38 types of beekeeping, 30 types of food, 39 types of commercial, 34 types of landscape, and 19 species of feed value and economic value have been specified. Bozdağ mass and areas covered with forests in the Karaburun Peninsula are rich areas in terms of wildlife.

Picture 3 - Orchids (Orchidaceae)

Picture 4 - Spanish broom (Spartium junceum)

The coastal and marine area of Karaburun is the breeding and habitat ground for the Mediterranean monk seals (monachus monachus), which are endangered and under international protection, and they are also bird species that are under national/international protection such as audouin's gull, short-toed eagle, lesser kestrel, eleonorae's falcon.

Otter (lutra lutra) and caracal (caracal caracal), greek spur-thighed tortoise, The Mediterranean horseshoe bat are also among the endangered species living in the Peninsula.

F.3.1.18. Lake Salda Specially Protected Environment Area

Salda Lake Specially Protected Environment Area is geographically located in the Mediterranean Region, within the borders of Burdur Province, Yeşilova District. The total area of the SPEA is 295,65 km², of which 43,7 km² is a terrestrial area. Since the area is a wetland, it is an area with high biological diversity. In this context, there are 301 aquatic and terrestrial plant species belonging to 61 families, and these species are categorized under 20 species in terms of danger class and endemism.

Map 21 - Lake Salda
(Ministry of Environment and Urbanization, 2020)

It is an internationally and nationally important area that hosts critical species under protection by the International Union for Conservation of Nature (IUCN) and meets the criteria of the important nature area and important bird area with its geological and chemical features, and the endemic species it hosts. Surveys conducted in the area reveal that Salda Lake is one of the two regions in the world, which has the surface properties of the planet Mars (magnesium-loaded white rocks).

F.3.2. Wetlands

Turkey is regarded as one of the most important countries in Europe and the Middle East in terms of wetlands. There are two major reasons for this; the first is that Turkey has rich and diverse wetland habitats with different ecological characteristics, and the second is that two of the four important bird migration routes in the Western Palearctic Region pass through Turkey.

Turkey became a party to the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (RAMSAR) in 1994 and registered 5 wetlands (Lake Manyas, Seyfe Lake, Burdur Lake, Sultan Reed Bed, and Göksu Delta), which are at the stage of becoming a party, in the contract list. The whole of Manyas (Bird) Lake and Burdur Lake, some of which were previously included in the contract list, as well as Gediz Delta, Akyatan Lagoon, Uluabat Lake, and Kızılırmak Delta, were included in the Contract List in 1998. Currently, there are 14 wetlands on a total area of 184,487 hectares (Table 89) within the scope of RAMSAR.

Table 89 - RAMSAR Areas of Turkey
(Ministry of Environment and Urbanization, 2020)

	NAME OF THE WETLAND	SURFACE AREA (ha)	PROVINCE	REGISTRY STATUS	REGISTRY DATE
1	**Lake Akyatan**	14,700	Adana	Ramsar	15.04.1998
2	**Lake Burdur**	24,800	Burdur	Ramsar	28.05.1994
3	**Gediz Delta**	14,900	İzmir	Ramsar	15.04.1998
4	**Göksu Delta**	15,000	Mersin	Ramsar	28.05.1994
5	**Kızılırmak Delta**	21,700	Samsun	Ramsar	15.04.1998
6	**Kızören Sinkhole**	127	Konya	Ramsar	02.05.2006
7	**Kuyucuk**	416	Kars	Ramsar	28.08.2009
8	**Lake Manyas (Bird)**	20,400	Balıkesir	Ramsar	28.05.1994
9	**Meke Maar**	202	Konya	Ramsar	21.07.2005
10	**Lake Nemrut**	4,589	Bitlis	Ramsar	17.04.2013
11	**Lake Seyfe**	10,700	Kırşehir	Ramsar	28.05.1994
12	**Sultan Reedbed**	17,200	Kayseri	Ramsar	28.05.1994
13	**Lake Uluabat**	19,900	Bursa	Ramsar	15.04.1998
14	**Yumurtalık Lagoon**	19,853	Adana	Ramsar	21.07.2005
	TOTAL	**184,487**			

59 wetlands have been registered as Wetlands of National Importance and 13 wetlands as Wetlands with Local Importance until today within the scope of the By-Law on the protection of Wetlands published in the Official Gazette No. 28962 dated 04/04/2014.

Table 90 – Wetlands of National Importance in Turkey
(Ministry of Agriculture and Forestry, 2020)

	NAME OF THE WETLAND	SURFACE AREA (ha)	PROVINCE	REGISTRY STATUS	REGISTRY DATE
1	**Karakuyu Redbeeds**	12,625	Afyonkarahisar	Nationally Important Wetland	7.02.2019
2	**Lakes of Akşehir and Eber**	117,779	Afyonkarahisar; Konya	Nationally Important Wetland	19.04.2017
3	**Lake Acıgöl**	55,095	Afyonkarahisar-Denizli	Nationally Important Wetland	8.04.2015
4	**Doğubeyazıt Redbeeds**	22,179	Ağrı	Nationally Important Wetland	10.06.2016
5	**Sarısu Plain Wetlands**	10,092	Ağrı	Nationally Important Wetland	8.04.2015
6	**Lake Tol**	1,414	Ankara	Nationally Important Wetland	19.04.2017
7	**Lake Avlan**	10,062	Antalya	Nationally Important Wetland	10.06.2016
8	**Lake Aktaş**	5,847	Ardahan	Nationally Important Wetland	8.04.2015
9	**Lake Çıldır**	27,058	Ardahan	Nationally Important Wetland	8.04.2015
10	**Lake Putka**	4,181	Ardahan	Nationally Important Wetland	8.04.2015
11	**Lake Azap**	2,183	Aydın	Nationally Important Wetland	7.02.2019
12	**Gönen Delta**	9770	Balıkesir	Nationally Important Wetland	10.06.2016
13	**Ahlat Reedbed**	243	Bitlis	Nationally Important Wetland	8.04.2015
14	**Lake Arin (Sodalı)**	4,322	Bitlis	Nationally Important Wetland	10.06.2016
15	**Lake Heybeli (Norşin)**	53	Bitlis	Nationally Important Wetland	8.04.2015
16	**Lake Nazik**	11,164	Bitlis	Nationally Important Wetland	8.04.2015
17	**İron Reedbed**	13,746	Bitlis; Muş	Nationally Important Wetland	8.04.2015
18	**Lake Yeniçağa**	8,224	Bolu	Nationally Important Wetland	9.04.2015
19	**Lake Çorak**	7,892	Burdur	Nationally Important Wetland	10.06.2016
20	**Lake Gölhisar**	5,877	Burdur	Nationally Important Wetland	10.06.2016
21	**Lake Yarışlı**	13,219	Burdur	Nationally Important Wetland	10.06.2016
22	**Lake Yazır**	2,705	Burdur	Nationally Important Wetland	10.06.2016
23	**Kocaçay Delta**	17,025	Bursa	Nationally Important Wetland	13.08.2018
24	**Lake İznik**	61,606	Bursa	Nationally Important Wetland	13.08.2018
25	**Gökçeada Lagoon**	3,491	Çanakkale	Nationally Important Wetland	7.02.2019
26	**Lakes Işıklı and Gökgöl**	33,693	Denizli	Nationally Important Wetland	10.06.2016
27	**Lake Efteni**	8,314	Düzce	Nationally Important Wetland	30.05.2018
28	**Güney Keban Dam**	41,424	Elazığ	Nationally Important Wetland	8.04.2015
29	**Lake Hazar**	28,846	Elazığ	Nationally Important Wetland	8.04.2015
30	**Ekşisu Reedbeds**	8,736	Erzincan	Nationally Important Wetland	12.06.2017
31	**Lake Tortum**	2,709	Erzurum	Nationally Important Wetland	19.04.2017
32	**Lake Balıkdamı**	14,147	Eskişehir	Nationally Important Wetland	7.02.2019

	NAME OF THE WETLAND	SURFACE AREA (ha)	PROVINCE	REGISTRY STATUS	REGISTRY DATE
33	**Karkamış Taşkın Plain**	27,396	Gaziantep; Şanlıurfa	Nationally Important Wetland	8.04.2015
34	**Yüksekova(Nehil) Reedbeds**	21,533	Hakkâri	Nationally Important Wetland	9.04.2015
35	**Lake Gölbaşı**	792	Hatay	Nationally Important Wetland	19.04.2017
36	**Aras Karasu Floods**	9,090	Iğdır	Nationally Important Wetland	10.06.2016
37	**Lake Aygır**	1,034	Kars	Nationally Important Wetland	8.04.2015
38	**Lake Çalı**	391	Kars	Nationally Important Wetland	10.06.2016
39	**Hürmetçi Reedbed**	15,713	Kayseri	Nationally Important Wetland	8.04.2015
40	**Lake Gölmarmara**	24,893	Manisa	Nationally Important Wetland	12.06.2017
41	**Dipsiz Lagoon**	1,035	Mersin	Nationally Important Wetland	12.06.2017
42	**Bulanık Plain Wetlands**	3,496	Muş	Nationally Important Wetland	10.06.2016
43	**Acarlar Longoz Forest**	17,528	Sakarya	Nationally Important Wetland	7.02.2019
44	**Lake Ladik**	1,836	Samsun	Nationally Important Wetland	8.04.2015
45	**Lake Tödürge**	4,340	Sivas	Nationally Important Wetland	10.06.2016
46	**Lake Ulaş**	7,994	Sivas	Nationally Important Wetland	10.06.2016
47	**Lake Akgöl**	1,203	Van	Nationally Important Wetland	8.04.2015
48	**Bendimahi Delta**	27,177	Van	Nationally Important Wetland	10.06.2016
49	**Çelebibağ Reedbeds**	1,337	Van	Nationally Important Wetland	10.06.2016
50	**Dönemeç Delta**	5,945	Van	Nationally Important Wetland	10.06.2016
51	**Lake Erçek**	22,269	Van	Nationally Important Wetland	10.06.2016
52	**Karasu Delta**	339	Van	Nationally Important Wetland	8.04.2015
53	**Lake Turna (Keşiş)**	3,045	Van	Nationally Important Wetland	8.04.2015
54	**Karamuk Reedbeds**	15,785	Afyonkarahisar	Nationally Important Wetland	31.07.2019
55	**Metruk Saltpan**	3,376	Muğla	Nationally Important Wetland	31.07.2019
56	**Lake Tuzla Palas**	17,320	Kayseri	Nationally Important Wetland	31.07.2019
57	**Meriç Delta**	29,046	Edirne	Nationally Important Wetland	19.03.2020
58	**Yeşilırmak Delta**	34,340	Samsun	Nationally Important Wetland	19.03.2020
59	**Lake Kozanlı Gökgöl**	5,723	Konya	Nationally Important Wetland	19.03.2020
	Total	**869,697**			

Table 91 – Wetlands with Local Importance in Turkey
(Ministry of Agriculture and Forestry, 2020)

	NAME OF THE WETLAND	SURFACE AREA (ha)	PROVINCE	REGISTRY STATUS	REGISTRY DATE
1	**Lake Aksaz**	133	Sinop	Locally Important	23.02.2016
2	**Lake Bakkal**	25	Çankırı	Locally Important	23.02.2016
3	**Lake Çiğ**	129	Ordu	Locally Important	11.08.2019
4	**Hersek Lagoon**	167	Yalova	Locally Important	23.02.2016
5	**Lake Samsam**	931	Konya	Locally Important	23.02.2016
6	**Lake Büyük Akgöl**	2,957	Sakarya	Locally Important	11.08.2019
7	**Seytan Sofrasi Wetland**	17	Balıkesir	Locally Important	24.01.2017
8	**Karakoç Stream Wetland**	38	Balıkesir	Locally Important	24.01.2017
9	**Erzurum Swamps**	8,632	Erzurum	Locally Important	18.05.2018
10	**Lake Küçük Akgöl**	187	Sakarya	Locally Important	11.08.2019
11	**Lake Keremali**	188	Sakarya	Locally Important	11.08.2019
12	**Lake Kaz**	315	Sivas	Locally Important	19.11.2019
13	**Lake Haydarlar**	794	Hatay	Locally Important	25.05.2019
	TOTAL	14,513			

F.3.3. Natural Protected Areas

Natural Protected Areas are above ground, underground or underwater areas that should be protected since they pertain to different geological periods and have extraordinary features due to their rarity.

While these areas were previously graded as 1st degree, 2nd degree and 3rd- degree natural protected areas, new status has been determined under the "By-Law on Procedures and Principles Regarding Determination, Registration, and Approval of Protected Areas" published according to the Decree-Law No. 644. New natural protected areas registrations and also the registrations made as a result of reevaluation are registered according to the statuses given in Table 92.

Table 92 - Number of Natural Sites
(Ministry of Environment and Urbanization, 2020)

PROTECTION STATUS (ha)	TOTAL NUMBER	TOTAL AREA
1st Degree Natural Protected Area	898	958,114,75
2nd Degree Natural Protected Area	283	44,686,35
3rd Degree Natural Protected Area	533	143,591,41
Ungraded Natural Protected Area	81	24,668,32
Sensitive Areas to be Strictly Protected	162	179,237,12
Qualified Natural Protected Areas	391	412,146,68
Sustainable Protection and Controlled Use Areas	403	141,377,87
TOTAL	**2.751**	**1,903,822,5**

Sensitive Areas to be Strictly Protected are the ones where there are extraordinary ecosystems and species on a regional, national or world scale, with exceptional geological and geomorphological features, with a unique ecosystem structure, and where biodiversity is protected. These are the areas that must be strictly protected, declared by the decision of the Council of Ministers and for which a building ban has been imposed.

Qualified natural protected areas are the ones where agricultural practices other than agriculture, medical and aromatic plant practices, applications for the use of livestock breeding, fishing port, pier, natural spring water, dams and ponds for drinking water, aquaculture activities excluding natural lakes and seas, mandatory technical infrastructure applications are carried out, and where tent camps, caravans and daily activities are carried out, which are compatible with the natural structure of the area and where materials such as concrete and asphalt are not used.

Sustainable protection and controlled use areas are the ones that allow for natural and culturally compatible low-intensity activities, integrated facilities, tourism and settlements, in addition to activities permitted in sensitive areas to be strictly protected and qualified natural protection areas considering the potential and usage characteristics of the area to protect and develop its silhouette, geological and ecological values.

F.3.4. National Parks, Nature Reserve Areas, Nature parks and Natural Monuments

Conservation areas are declared in the status of National Park, Nature Reserve Area, Nature park and Natural Monument within the framework of the National Parks Law No. 2873.

National parks are defined as "a natural area having, from scientific and aesthetic standpoints, both natural and cultural values of rare national and international stand, and natural, recreational and touristic sites. Turkey possesses 40 National Parks as of 2015 (Table 93). National parks have great importance in protecting biodiversity in forest, steppe, wetland and coastal ecosystems.

When the "National Parks Law" entered into force in 1983, using the term "nature parts" as well as the term "forests" allowed this law to be applied to areas outside forests that require protection. Since the main purpose is to conserve nature, the expression "Nature Reserve" has been added to the laws. Nature Reserve Areas are defined as natural areas that are designated to be used only for scientific and educational purposes containing rare, threatened or endangered ecosystems and/or species and outstanding samples brought about by natural phenomena, and which should definitely be protected". There are 30 Nature Protection Areas in Turkey as of 2020.

"Nature Park" is defined as a natural area containing characteristic vegetation and wildlife features, and is suitable for recreation activities and repose of the public in its scenic wholeness. There were 204 Nature Parks as of 2015, 208 as of 2016, and 247 as of 2020, which were announced for this purpose in our country.

Table 93 – National Parks of Turkey
(Ministry of Agriculture and Forestry, 2020)

No	Province	Name of the National Park	Surface Area(da)	Year of Declaration
1	**Yozgat**	Yozgat Piney	266,902248	5.02.1958
2	**Osmaniye**	Karatepe - Aslantaş	4142,90863	29.05.1958
3	**Ankara**	Soğuksu	1186,262189	19.02.1959
4	**Balıkesir**	Kuşcenneti	17058,36511	27.07.1959
5	**Bursa**	Uludağ	13024,06625	20.09.1961
6	**Bolu**	Yedigöller	1623,06934	29.04.1965

No	Province	Name of the National Park	Surface Area(da)	Year of Declaration
7	**Aydın**	Dilek Y. – B. Menderes D.	27598,16218	19.05.1966
8	**Manisa**	Mount Spil	6801,026208	22.04.1968
9	**Isparta**	Kızıldağ	80200,4197	9.05.1969
10	**Antalya**	Mount Güllük - Termessos	6699,977344	3.11.1970
11	**Isparta**	Lake Kovada	6550,708833	3.11.1970
12	**Tunceli**	Munzur Valley	42674,48596	21.12.1971
13	**Antalya**	Beydağları Coastal	31165,87678	16.03.1972
14	**Antalya**	Köprülü Kanyon	47473	12.12.1973
15	**Kastamonu**	Mount Ilgaz	1117,696365	2.06.1976
16	**Afyon**	Başkomutan Historical National Park	34833,60424	8.11.1981
17	**Trabzon**	Altındere Valley	4467,714133	9.09.1987
18	**Çorum**	Boğazköy – Alacahöyük	2600,43768	21.09.1988
19	**Adıyaman**	Mount Nemrut	13827,27676	7.12.1988
20	**Konya**	Lake Beyşehir	82156,8951	11.01.1993
21	**Balıkesir**	Kazdağı	20934,8334	17.04.1994
22	**Antalya**	Altınbeşik Cave	1146,647581	31.08.1994
23	**Artvin**	Hatila Valley	16943,77941	31.08.1994
24	**Artvin**	Karagöl – Sahara	3250,971849	31.08.1994
25	**Rize**	Kaçkar Mountains	52970,0776	31.08.1994
26	**Niğde**	Aladağlar	55064,40812	21.04.1995
27	**Muğla**	Marmaris	29206,02199	8.03.1996
28	**Muğla**	Saklıkent	1643,29524	6.06.1996
29	**Çanakkale**	Troya Historical National Park	13517,18737	7.11.1996
30	**Denizli**	Mount Honaz	9428,975644	21.04.1998
31	**Kastamonu**	Küre Mountains	37753,3752	7.07.2000
32	**Kars**	Sarıkamış-Allahuekber Mountains	22519,88539	19.10.2004
33	**Ağrı**	Mount Ağrı	88014,80365	17.11.2004
34	**Edirne**	Lake Gala	5923,49	5.03.2005
35	**Kayseri**	Sultan Reedbed	24357,69914	17.03.2006
36	**Şanlıurfa**	Tek TekMountains	19335,24053	29.05.2007
37	**Kırklareli**	İğneada Longoz Forests	3155,001931	13.11.2007
38	**Adana**	Yumurtalık Lagoon	16979,94153	6.12.2008
39	**Erzurum**	Nene Hatun Historical National Park	387,4231548	6.06.2009
40	**Ankara**	Sakarya Meydan Muharebesi Historical National Park	13850,46392	8.02.2015
41	**Bayburt**	Kop Dağı Müdafaası Historical National Park	6335,100131	15.11.2016
42	**Muş**	Malazgirt Meydan Muharebesi Historical National Park	238,3281702	17.03.2018
43	**Kastamonu**	İstiklal Yolu Historical National Park	235,7	2.11.2018
44	**Siirt**	Botan Valley	11358,28392	15.08.2019
Total Area			**880,019,7899**	

Natural monuments are defined as natural areas having the characteristics and scientific values brought about by nature or natural phenomena and protected within the framework of the principles on national parks. 116 areas have been under conservation as Natural Monuments as of 2020.

F.3.5. Wildlife Development Areas and Breeding Stations

Natural habitats of endangered wild animals have been taken under protection under Law no. 4915, to protect these species together with their habitats without deteriorating their ecosystem characteristics. Breeding activities for some species are also carried out in some areas. 84 areas have been declared as Wild Life Development Areas in Turkey so far. Some projects are carried out to protect endangered species such as Anatolian Wild Sheep, Cinereous Vulture, Great bustard, Capercaillie, Hyena, Fallow Deer and Bald Ibis. Anatolian Wild Sheep population (Ovis gmelinii anatolica) is under protection in Bozdağ in Konya, Gazelle (Gazella subgutturosa) population is under protection in Kızılkuyu, Urfa, Bald Ibis (Geronticus eremita) population is under protection in Birecik, Urfa and extinction of these species have been relatively prevented. Breeding stations have been established in İstanbul Bahçeköy, Eskişehir-Mihalıççık, İstanbul-Polenezköy and Samsun-Vezirköprü for Red Deer (Cervus elaphus), in Antalya Eşenadası for Fallow Deer (Dama dama), in Hatay Kırıkhan for Mountain Gazelle (Gazella gazella), in Ankara Nallıhan for Anatolian Wild Sheep (Ovis gmelinii anatolica) and in Gaziantep Erikçe for Goitered gazelle (Gazella subgutturosa) to increase population of endangered animals and support their breeding.

The number of wild animal species in our country has been determined as 761. Of these, 150 species have been as recorded mammals, 481 species have been recorded as birds and 130 species have been recorded as reptiles. Amin these 629 species of the wild animals; 121 mammals, 378 birds and 130 reptiles, have been taken under protection, and a total of 113 species, 10 mammals and 103 birds, have been determined as game animals.

F.3.6. Natural Heritage

The "monumental trees" and "caves" are above ground, underground or underwater values belonging to geological periods, prehistoric and historical eras and that need to be preserved in terms of their rarity or features and beauty. They have been taken under protection as natural assets.

Table 94 – Number of Registered Monument Trees inTurkey
(Ministry of Environment and Urbanization, 2020)

Total Number of registered trees	9.092
The Number of monumental trees registered by the Ministry of Environment and Urbanization (General Directorate for Protection of Natural Assets)	1,020

Table 95 – Number of Registered Caves inTurkey
(Ministry of Environment and Urbanization, 2020)

Total Number of registered caves	231
The Number of caves registered by the Ministry of Environment and Urbanization (General Directorate for Protection of Natural Assets)	30

F.4. Bio-Security Studies

Species action plans are prepared by the Ministry of Agriculture and Forestry to protect the flora richness of our country and monitoring studies are carried out within the framework of the projects implemented in line with these plans. 65 plant species action plans have been made as of today, and the targeted activity studies are in progress.

F.5. Invasive Alien Species in Turkey (The Worst Invasive Alien Species in Turkey)

14 of the world's 100 worst invasive alien species published by The World Conservation Union (IUCN), are in Turkey. These include eastern mosquitofish (gambusia holbrooki), warty comb jelly (mnemiopsis leidyi), veined rapa whelk (Rapana venosa), prussian carp (carassius gibelio), zebra mussel (dreissena polymorpha), water hyacinth (eichornia crassipes), killer algae (caulerpa taxifolia), rainbow trout (oncorhyncihus mykiss), crucian carp (Carassius carassius), mozambique tilapia (Oreochromis mossambicus), coypu (Myocastor coypus), red-eared slider (trachemysscripta elegans), black rat (rattus rattus) and african sharptooth catfish (clarias gariepinus).

The species that are not included in the IUCN list but dangerous for Turkey include Kallar grass (diplachne fusca), persicaria perfoliat, Cutleaf groundcherry (Physalis angulata L), Physalis philadelphica Lam. var. immaculata Waterf, Red-eared slider (Trachemysscripta elegans), Bur cucumber (Sicyos angulatus), Black locust (Robinia pseudoacacia), Lamb's Quarters, Hottentot plant (Carpobrotus acinaciformis), Tree of heaven, Ailanthus (Ailanthus altissima), Annual ragweed (Ambrosia artemisiifoli), Desert locust (Schistacerca gregaria) and Rose-ringed parakeet (Psittacula krameri).

F.5.1. Invasive Alien Species in Turkey's Seas

Due to changes in seawater temperature and water parameters as a result of climate changes because of global warming, and ship ballast waters, many species of Indo-Pacific origin have passed to our seas. The species that are predicted to harm the ecosystems, biological diversity, fishing economy, and human health in our seas are pufferfish (lagocephalus sceleratus), dusky spinefoot (Siganus luridus), the nomad jellyfish (rhopilema nomadica), common lionfish (pterois miles), and sea urchin.

Upon the opening of the Suez Canal, 790 fish species have entered into Mediterranean waters. While the number of invasive alien species in Turkey's seas was 263 in 2005, this number has reached to 450 in the Eastern Mediterranean Sea. There are 160 invasive alien species in the Mediterranean Sea, 330 in the Eastern Mediterranean Sea, 165 in the Aegean Sea, 69 in the Sea of Marmara, and 21 in the Black Sea. Although 66% of the invasive alien species in the Mediterranean Sea has come through Suez Canal, 80% of those in the Black Sea has come through ballast water from the ships.

Picture 5 - Killer Algae (Caulerpa taxifolia)

Examples of invasive alien species identified in our seas include Mnemiopsis leidyi (Warty comb jelly), Rapana venosa (Veined Rapa Whelk), Lagocephalus sceleratus (pufferfish), and Caulerpa taxifolia (Killer Algae). An "Invasive Foreign Species Interface" has been created under the Noah's Ark Biodiversity Database to monitor these species.

Picture 6 - Veined Rapa Whelk (Rapana venosa)
(Prof. Dr. Bayram ÖZTÜRK)

F.5.2. Invasive Alien Fish Species in Turkey's Inland Waters

There are nearly 370 fish species in our inland waters, and some invasive fish species are released into our inland waters illegally and as a result, many freshwater fish species are under threat. Many lakes and streams are infested by mosquito fish, zander, prussian carp (carasius gibelio) hardyhead silverside, tench, molebat, stone moroko, and zebra mussel, which do not belong to Turkey's fauna. Catching of invasive species is allowed exceptionally without taking into account the prohibitions and restrictions imposed in terms of time and means of production (For example; prussian carp/carasius gibelio) within the scope of combating invasive species, with the Communiqué No. 4/1 on the By-Law on Commercial Fisheries. Also, there are no fishing restrictions for Big-scale sand smelt (atherina boyeri). On the other hand, administrative sanctions have started to be imposed on those who fish in water resources without permission with the amendment to Fisheries Law No. 1380.

F.6. Areas Vulnerable to Erosion and Desertification in Turkey

F.6.1. Combating with Erosion

"Climate change and global warming" are among the biggest problems faced by humanity in the 21th century and they bring along a chain reaction between desertification, water and wind erosion, and aridity, which are the main causes of land degradation.

With the increasing population, the demand for forest products, agricultural and animal products increases day by day, so the pressure on the soil, which is the main production source of these products, is increasing at the same rate. Such changes in population and demand structure directly affect food security and related ecosystem services. Moreover, since climate change triggers social and economic problems, the pressure on agriculture is increasing faster than expected.

Considering the increasing population trend and the decreasing existence of agricultural lands that will feed this population in Turkey, the loss of land assets by natural or artificial means and loss of their qualifications should be prevented as soon as possible. For this, it is necessary to implement measures that will ensure planned land-use by the principle of sustainable development with environmental priority.

Dynamic Erosion Model and Monitoring System (DEMIS) software has been developed by the Ministry of Agriculture and Forestry to dynamically monitor the erosion occurring in our country and to determine the policies for taking relevant necessary measures. The statistics on the amount of sediment displaced as a result of water erosion in our country and which factors caused these losses were revealed for 25 main water basins, and 81 provinces through this software developed. Thus, Water Erosion Map for Turkey was produced by determining the annual average soil losses in Turkey's main water basins. (https: // www. tarimorman.gov.tr/CEM/Belgeler/yay%C4%B1nlar/yay%C4%B1nlar%202019/T%C3%BCrkiye%20% 20Erosionu% 20Atlas% C4% B1.pdf) (Map 22).

Furthermore, the Presidential Circular no.2020/7 was published using the Water Erosion Map for Turkey as a natural resource planning tool in terms of monitoring soil resources and evaluating them effectively and efficiently.

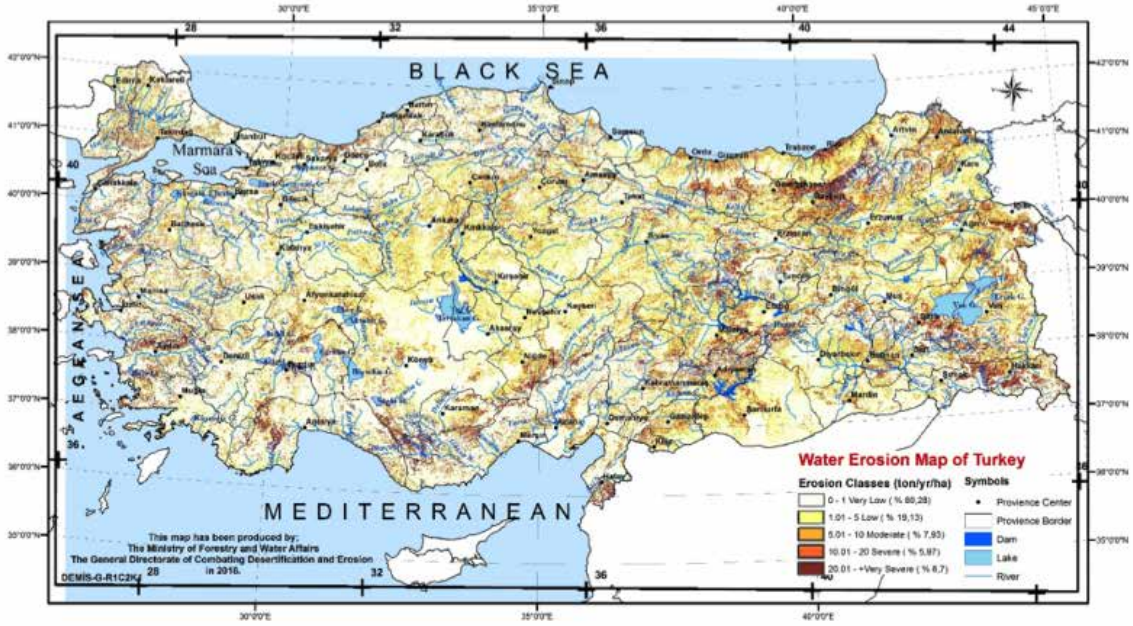
The possible erosion threats should be estimated under correct scenarios and assessments should be carried out on a high scale to combat wind erosion along with water erosion and to minimize the damages to occur with effective future planning. The National Dynamic Wind Erosion Model and Monitoring System (UDREMIS) software has been developed to detect areas of potential wind erosion and those exposed to wind erosion. Thus, a sensitivity map was produced for areas of potential wind erosion in Turkey. The Wind Erosion Map of Turkey will be available to users and planners following the measurement and validation studies to be carried out.

The "National Afforestation and Erosion Control Mobilization Action Plan" covering the years 2008-2012 was prepared and works regarding afforestation, erosion combating and rehabilitation of forests were carried out in an area of 2 million 429 thousand hectares in five years. Moreover, afforestation, erosion control, rehabilitation of degraded forest areas, pasture improvement, energy forest establishment, artificial regeneration and special afforestation works were carried out in our country until the end of 2019. While the efforts conducted on 1,550,000 ha of were erosion control works, and other efforts indirectly contributed to erosion prevention.

While the amount of soil transported to seas, lakes and dams by erosion was 500 million tons per year in the 1970s, this amount has decreased to 154 million tons per year according to the measurements of today. The goal of the Ministry of Agriculture and Forestry is to decrease the amount of soil lost by erosion to 130 million tons annually in 2023.

The spatial and areal analysis of the amount of soil transferred as a result of erosion has been conducted through the new evaluations made after many years. The erosion intensity classes on the Water Erosion Map of Turkey were analyzed in terms of different land-use types and different slope groups, and as a result, applying the protection methods with techniques suitable for the erosion areas of spatial priority has become possible in combating erosion. Together with these activities to be carried out, efforts have been accelerated to reduce the amount of soil lost and transported by erosion from 154 million tons to 130 million tons until 2023.

Map 22 – Water Erosion Map of Turkey
(Ministry of Agriculture and Forestry, 2020)



The projects are implemented on the wind erosion in the agricultural lands that TAGEM agricultural activities are carried out and pastures in Konya-Karapınar Area, and on the land protection in agricultural soils, erosion prevention soil cultivation and protective cover in the Mediterranean, Aegean and Central Anatolia and Black Sea Passage Zone and as well as those on land degradation trends in different land-uses-vegetation changes, effects of wind erosion and precautions and measures to be taken against these effects within the scope of the "Combating Climate Change and Erosion" target included in the Strategy Action Plan of the Ministry of Agriculture and Forestry (2019-2023). Within the scope of the projects, the studies on how the farmers in that area can carry out agricultural activities to protect their land from water and wind erosion are carried on in a way that will guide the producers and serve the objectives of our Ministry's National Strategy and Action Plan for Combating Desertification (2015-2023).

F.6.1.1. Projects on Dam Catchments Green Belt Afforestation

The " Action Plans of Dam Basins Green Belt Afforestation" covering the years 2013-2019 has been prepared for increasing water quality and efficiency with simultaneous afforestation, erosion control and rehabilitation works, creating new recreation and tourism areas, creating new habitats for wildlife. It is planned to work in 568 Dams and Pond Basins under the Action Plan. The Ministry of Agriculture and Forestry provided project support by producing 85 afforestation and erosion control projects as of the end of 2019 within the scope of the action plan.

F.6.1.2. Farm and Roadside Afforestation

The Ministry of Agriculture and Forestry carries out land consolidation works in agricultural areas to bring together the divided, fragmented parcels that do not allow to be used and to carry out efficient agricultural activities.

The field and roadside afforestation project aims to prevent the degradation caused by desertification and erosion in agricultural areas, to create alternative income sources for the locals, to establish new recreational areas, to create sheltered areas for wild animals, to provide biological control with plant pests.

A total of 34 projects were prepared as of the end of 2019 in Konya, Karaman, and Niğde provinces where wind erosion was experienced a lot.

F.6.1.3. Upper Basin Flood-Control Projects

The "Upper Basin Flood Control Action Plan" covering the years 2013-2019 was into practice to protect the soil and natural resources and to reduce the damages caused by flood damages.

The Action Plan aims to work in 25 main river basins and 360 flood basins of priority importance. The General Directorate of Combating Desertification and Erosion provided project support by producing 132 flood control projects as of the end of 2019 within the scope of the action plan.

F.6.1.4. Landslide Control Projects

Our country is among the countries where natural disasters frequently occur due to its geological, geomorphological, climatic and topographic characteristics. Among these disasters, landslides are the most destructive after earthquakes. Floods and landslides are intertwined in our country, especially in the Eastern Black Sea Region. Floods trigger landslides and, landslides increase the destructive power of floods.

The Ministry of Agriculture and Forestry produced projects on protecting the agriculture, forest, pasture and residential areas to minimize the damages caused by landslides.

The Ministry of Agriculture and Forestry prepared 18 Landslide Control Projects the of 2019 and directed them to the implementing units.

F.6.1.5. Avalanche Control Projects

There has been an increase in loss of life and damage caused by avalanches as a result of increasing human activities (tourism facilities, hunting, mountaineering, etc.) in mountainous areas. Application projects are produced, considering the active and passive avalanche prevention techniques, to reduce the damages caused by avalanches.

The Ministry of Agriculture and Forestry prepared 20 Avalanche Control Projects the of 2019 and directed them to the implementing units.

F.6.1.6. Projects on Rehabilitation of Mining Fields

The "Mining Fields Rehabilitation Action Plan" aims to bring the completed minefields in forest areas into nature through rehabilitation. Rehabilitation in an area of 5,805 hectares was targeted within the scope of the action plan covering the period of 2014-2018.

The General Directorate of Combating Desertification and Erosion, General Directorate of Forestry, General Directorate of Nature Conservation and National Parks within the Ministry of Agriculture and Forestry carried out cooperatively the activities under the Action Plan.

The General Directorate of Combating Desertification and Erosion prepared 8 projects within the scope of the Action Plan as of the end of 2018 to be implemented by the General Directorate of Forestry.

F.6.2. Desertification

Soil erosion, proper land-use and incorrect agricultural practices, especially in areas where semi-arid climatic conditions are effective, salinization as a result of incorrect irrigation techniques, salty and gypsiferous parent materials with an extremely alkaline reaction preventing the growth of plants, deforestation, overgrazing, and topsoil contamination are effective in the formation of desertification areas in Turkey. But the main reason is the increasing demand and pressure of the increasing population for natural resources. In general, 65% of our country's lands have arid, semi-arid, and semi-humid climates. The deterioration of the natural balance through the destruction of the vegetation cover leads to erosion of the soil and subsequently the parent material in these ecologically sensitive areas.

F.6.2.1. Combating Desertification in Turkey

Turkey officially became a party to the UN Convention to Combat Desertification (UNCCD) in 1998 and accelerated its efforts on desertification with the preparation of the " National Action Programme to Combat Desertification", which entered into force with the circular published in the Official Gazette dated 9 March 2005.

The "Turkish National Action Plan to Combat Desertification" has been in effect since 2005 and has been renewed following the ten-year Strategy of the UNCCD. The National Action Plan has been prepared with the participation of all relevant institutions, organizations, NGOs, and universities and has been updated together with the National Strategy to Combat Desertification, of which preparations started in 2012, and became a single document under the name of "The National Strategy and Action Plan to Combat Desertification (2015-2023)". Within the scope of the action plan, web-based monitoring, evaluation and reporting system has been prepared and implemented for effective online collection and report of the activities of the institutions/organizations. (http://cmusep.cem.gov.tr)

Under the ongoing process; the National Strategy and Action Plan to Combat Desertification (NSAPCD) has been updated in line with the new UNCCD 2018-2030 Strategic Framework, the United Nations 2030 Sustainable Development Targets in the direction of the goal of Sustainable Development Target 15.3 "to achieve a land degradation-neutral world" to cover the years 2019-2030. NSAPCD summarizes the strategic approach and the work planned to be carried out between 2019-2030 within the scope of combating desertification/land degradation in Turkey and aims to form a basis for the effective and cooperative implementation of the works planned by different institutions.

The Ministry of Agriculture and Forestry carries out regional and national projects in line with the goals and objectives in the plan for developing strategies and policies regarding conserving the soil in agriculture and pasture lands, combating desertification and erosion, land degradation neutrality (LDN), and the relevant issues within the scope of the Strategic Action Plan (2019-2023) and the National Strategy and Action Plan to Combat Desertification (2015-2023).

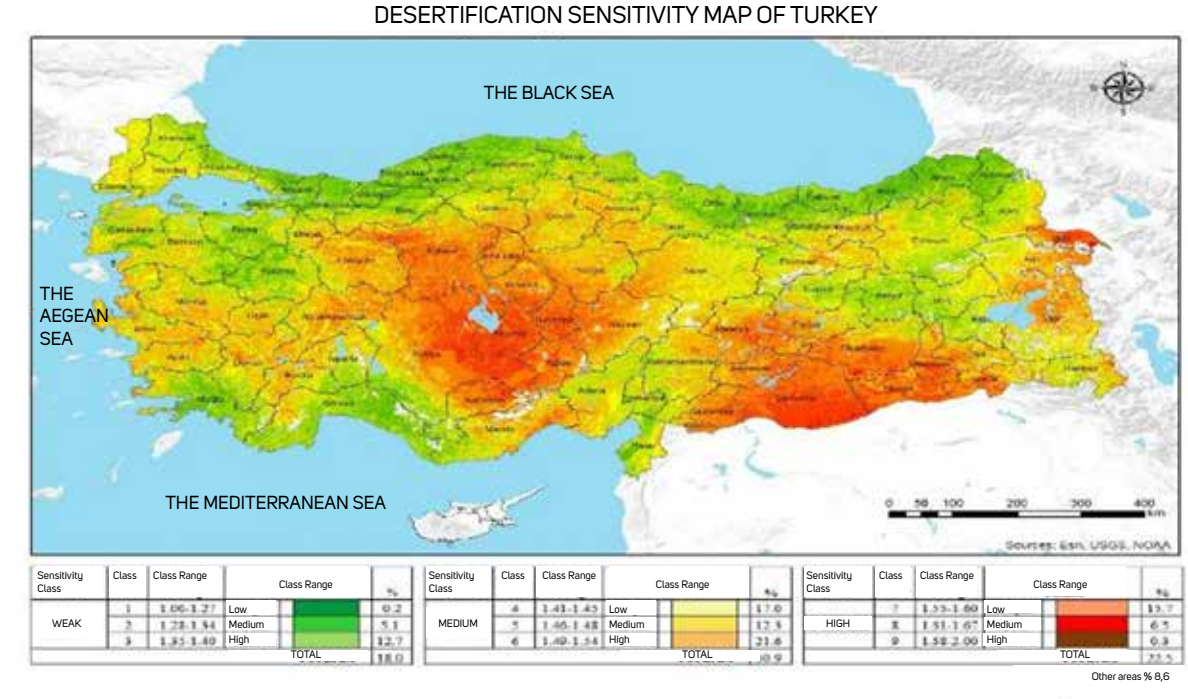
Soil Organic Carbon Information System and Organic Carbon Map of Turkey has been produced together with FAO. Furthermore, land change and degradation maps, temporal changes in dune areas and their environmental effects, areas lost due to wind erosion, and agricultural gains in the process were presented in detail under the project on "Change of Land Degradation, The Effects and Environmental Evaluation on Manisa Akselendi Plain under The Effect of Wind Erosion ", which might be the first example of studies on LDN.

F.6.2.2. Desertification Sensitive Areas

The Desertification Model of Turkey, produced within the scope of the Development of Basin Monitoring and Evaluation System (HİDS) Project carried out in cooperation with the Ministry of Agriculture and Forestry and TÜBİTAK-BİLGEM (TURKSAT Informatics and Information Security Research Center), is

highly important for mathematical description, in a dynamic structure, of the interactive effects of the geographically based, climate, water, soil, land cover and use, topography and geomorphology and human-related processes specific to Turkey on land degradation and desertification. The Desertification Model of Turkey, developed as a geographically based mathematical model specific to Turkey, was planned and carried out as an important study that can detect the sensitivity of land degradation and desertification, produce basin-scale sensitivity maps and monitor desertification and land degradation risks with its dynamic structure. Within the scope of the project, desertification criteria and densities of Turkey have been determined as follows.

Map 23 - Desertification Sensitivity Map of Turkey
(Ministry of Agriculture and Forestry, 2020)



The 7 most important criteria that cause desertification in Turkey and their densities

No	Criteria	Density (%)
1	Climate	35.6
2	Water	18.4
3	Soil	17.2
4	Land Cover and Land-use	11.6
5	Topography and Geomorphology	6.3
6	Socio Economy	6.2
7	Management	4.7

As a result of the verification and calibration studies carried out, it has been detected that 22.5% of the spatial entity of Turkey shows high sensitivity to desertification, 50.9% shows medium desertification sensitivity, and 18% shows low desertification sensitivity. It has been determined that the Konya Closed Basin, the middle and southern parts of the Sakarya and Kızılırmak basins, an important part of the Fırat-Dicle Basin, the part of the Thrace outside the Black Sea coast and the Iğdır-December section of the Aras

Basin have a high sensitivity to desertification. Development of management strategies and investment priorities with relevant institutions and organizations for areas with high sensitivity to desertification are under the action plans of the Ministry of Agriculture and Forestry.

F.6.2.3. Project on Land Degradation Neutrality Target and Balancing Land Degradation in Upper Sakarya Basin

Support has been provided to other countries through the Ankara Initiative within the framework of Target 15.3 "to achieve a land degradation-neutral world" under the Sustainable Development. During this ongoing process, there has been a need for a project with permanent results to realize the LDN targets. In this direction, the "Project on Land Degradation Neutrality Target and Balancing Land Degradation in Upper Sakarya Basin (2019-2022)" was initiated in the GEF 6 Period.

The purposes of the project are;

- To improve land cover, soil organic carbon and land productivity, the three indicators of LDN, through Sustainable Land Management (SLM) and Sustainable Forest Management (SFM) activities to be carried out in forest, pasture and agricultural areas in Sakarya Basin,
- To contribute to the creation of a roadmap for the success of LDN targets,
- To contribute to the development of methods and tools for the implementation, monitoring and evaluation of LDN and to complete the deficiencies,
- To improve the LDN reporting capacity,
- To ensure the verification and calibration of our country's experience and monitoring and evaluation systems (Basin Monitoring and Assessment System-HIDS, Desertification Model and Map of Turkey, Dynamic Erosion Model and Monitoring System, Soil Organic Carbon, UAIS, POS, etc.) developed in the project area so far within the scope of combating land degradation/desertification and erosion, identification the gaps regarding them, spread of these systems throughout the country and establishment Decision Support System based on these.

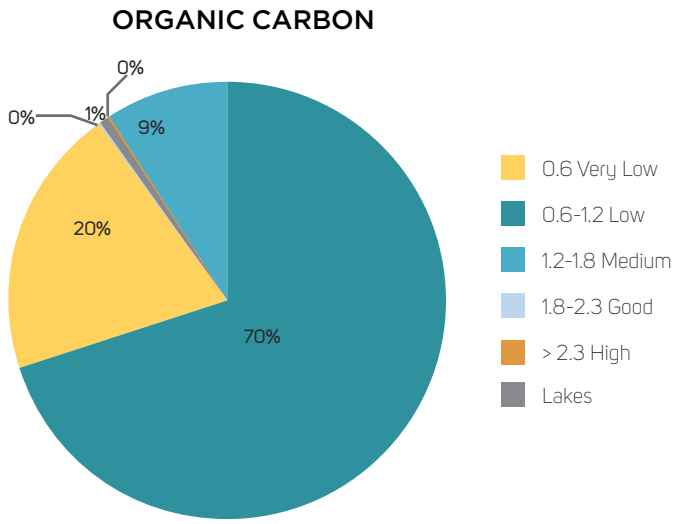
F.6.2.4 Monitoring Soil Organic Carbon Stocks

Organic matter is not only the most important carbon source in our soils but also the most important criterion in the fertility of agricultural soils. The first study to reveal the organic matter status and physical and chemical properties of Turkey's top agricultural soils was initiated in 2010. Determination of soil characteristics, creation and mapping of a geographical database are important in terms of providing important preliminary information, which is lacking in soil-based research studies for land-use planning, to our farmers. Moreover, it can be used as an important sub-information in detailed regional rural development studies and biodiversity research. An important sub-geographic data bank regarding soil properties that are considered necessary in soil and water resources research, soil degradation, adaptation to climate change, regional action planning, soil properties and plant biodiversity relationship studies will be established and put into service to research under this project.

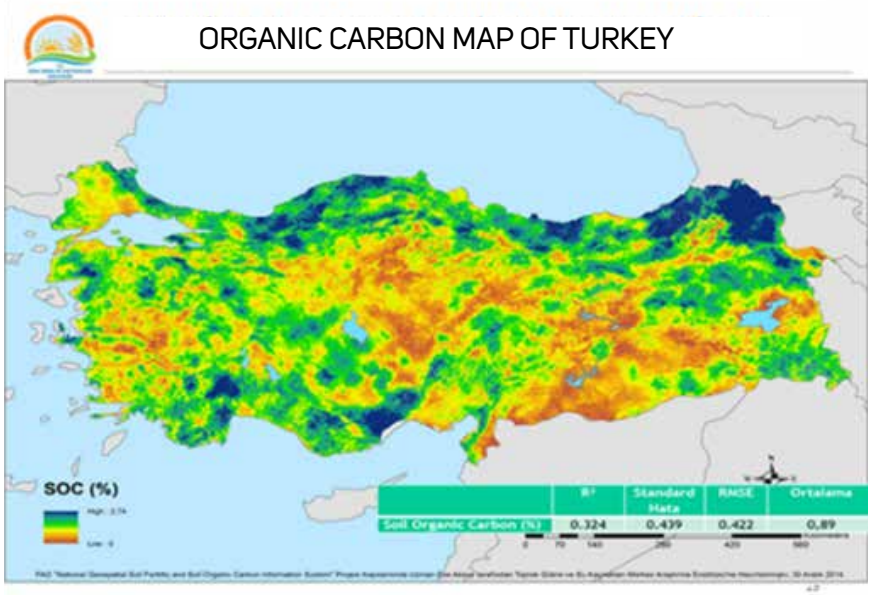
The first study on the determination of organic carbon in Turkey has been carried out under the FAO-Turkey Partnership Program (FTPP-I) in cooperation with the Ministry of Agriculture and Forestry and FAO. The agricultural soils represented by 8,000 samples across the country were mapped in terms of carbon stock map, macro and micro plant nutrients in addition to organic carbon, and the "Soil Carbon Map of Turkey" was created in the geographical database between 2010 and 2015. These data were later

processed by FAO on the World Organic Carbon Map (Map 24) on behalf of Turkey and included in the "The Global Soil Organic Carbon Map" (Map 25).

Graph 46 - Agricultural Land Soil Organic Carbon Distribution of Turkey (Ministry of Agriculture and Forestry, 2020)

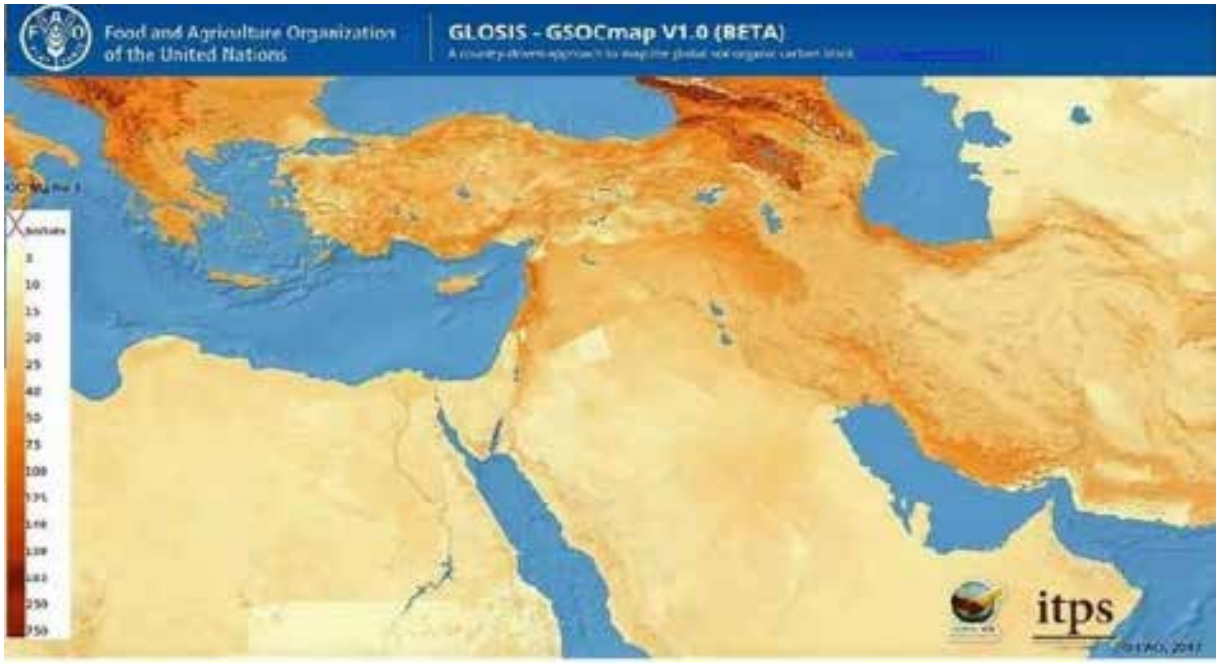


Map 24 - Organic Carbon Map of Turkey
(Ministry of Agriculture and Forestry TAGEM, 2015)



A soil organic carbon (SOC) stock map with a depth of 0-20 cm was produced for Turkey (Map 25) by developing a geographic-based soil organic carbon model at the national scale within the scope of the project carried out by the Ministry of Agriculture and Forestry in cooperation with TÜBİTAK-BİLGEM. It has been calculated total SOC stock of Turkey, with an area of approximately 78 million ha, is 3 billion 516 million tons.

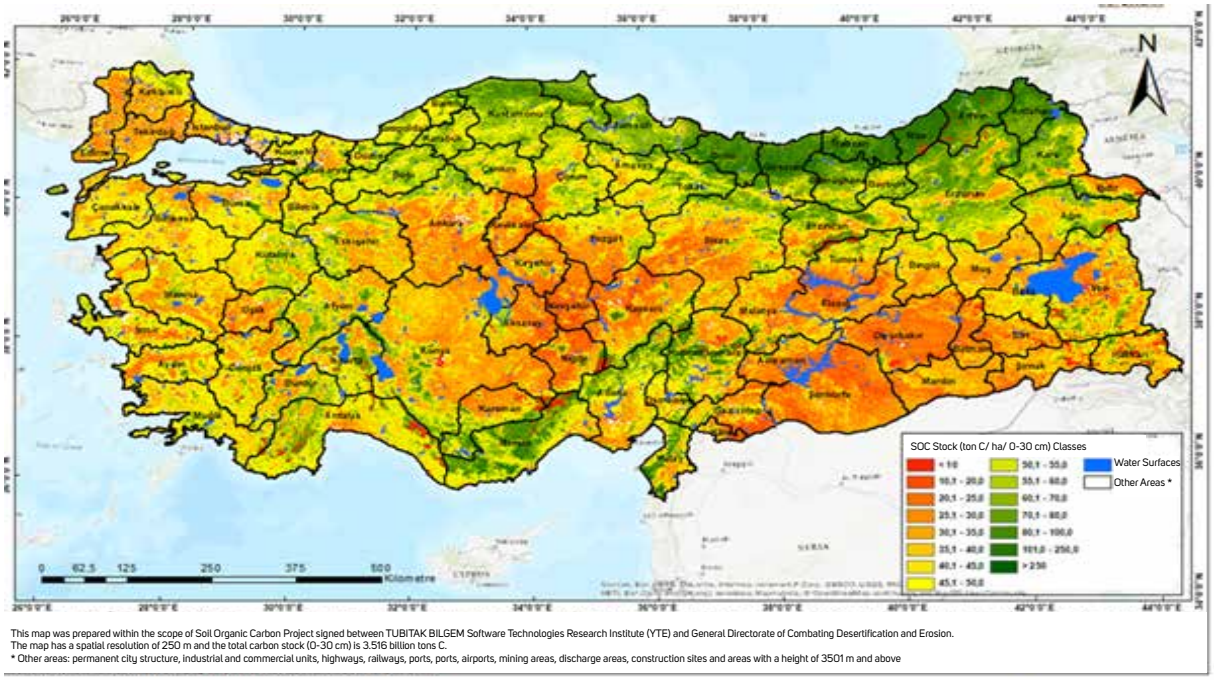
Map 25 - The Global Soil Organic Carbon Map
(FAO, 2020)



It has been determined that the SOC stocks in the unit area (ton C ha -1) determined for the land-use class (forest, agriculture, pasture, wetlands and water surfaces, artificial areas and other areas) and which can be accepted as reference values are mostly in forest areas, followed by pasture areas and the least in bare areas.

SOC stock values in total and unit area can be produced on the country, province and district, and basin for 6 land-use classes which are addressed within the scope of the project and LULUCF. The data obtained from the produced map can be used in the preparation of the LDN National Report and in evaluating the effects of the improvement works to be carried out. It will also form an important basis for the greenhouse gas inventories prepared within the scope of the United Nations Framework Convention on Climate Change and the Kyoto Protocol, signed by Turkey and which we are obliged to notify. It will also be able to guide the decision-makers on the effects of the rehabilitation works, carried out on degraded forests, pastures and agricultural lands under the investment projects for which land-use change decisions are made, on SOC stocks.

Map 26 - Total Organic Carbon Stock Classes
(Ministry of Agriculture and Forestry, 2020)



This map was prepared within the scope of Soil Organic Carbon Project signed between TUBITAK BILGEM Software Technologies Research Institute (YTE) and General Directorate of Combating Desertification and Erosion.
The map has a spatial resolution of 250 m and the total carbon stock (0-30 cm) is 3.516 billion tons C.
* Other areas: permanent city structure, industrial and commercial units, highways, railways, ports, ports, airports, mining areas, discharge areas, construction sites and areas with a height of 3501 m and above

F.6.3. General Assessment of Basin Rehabilitation

Basin Rehabilitation includes the activities carried out to improve the social, cultural and economic welfare of the people living in the basin by taking technical, cultural and administrative measures to ensure the natural balance between soil, water and vegetation.

Duties and authorities of many state institutions include the activities carried out in the water basins of our country. Furthermore, it has been understood that the participation of other interest groups such as local people and non-governmental organizations in basin rehabilitation activities is of great importance for the sustainable management of natural resources. For this reason, "Integrated Basin Rehabilitation Plans and Projects" that handle ecological, social, cultural, and economic dimensions of the matter have been carried out in basins since the 1990s with the participation of all sectors and all interest groups in the field. 4 integrated basin projects prepared with external financing provided by international organizations and 17 integrated basin projects prepared with our national resources are listed below:

- Eastern Anatolia Watershed Rehabilitation Project (1993-2001)
- Anatolian Watershed Rehabilitation Project (2005-2011)
- Coruh River Basin Rehabilitation Project (2012-2021)
- Murat River Basin Rehabilitation Project (2013-2022)
- Şanlıurfa; Tektek Mountains Microcatchment Integrated Flood Control Project (2014-2016)

- Konya-Hadim and Taşkent; Upper Göksu Basin Gökdere Integrated Microcatchment Rehabilitation Project (2014-2018)
- Karaman-Ayrancı; Konya Closed Basin, Başlamışlı-Kocadere Integrated Microcatchment Rehabilitation Project (2015-2019)
- Afyonkarahisar-Şuhut; Akarçay Basin, Hüseyinli-Belenyurdu Integrated Microcatchment Rehabilitation Project (2014-2018)
- Afyonkarahisar-Şuhut; Akarçay Basin, Şuhut Stream Integrated Microcatchment Rehabilitation Project (2015-2019)
- Konya-Bozkır-Hadim; Upper Göksu Basin, Bağbaşı Dam Integrated Microcatchment Rehabilitation Project (2015-2019)
- Denizli-Çameli; Western Mediterranean Basin, Karanfilli Creek Integrated Microcatchment Rehabilitation Project (2017-2021)
- Manisa-Selendi; Gediz Basin, Selendi Stream Integrated Microcatchment Rehabilitation Project. (20172021)
- Denizli-Çameli; Western Mediterranean Basin; Akdere Stream Integrated Microcatchment Rehabilitation Project (2018-2022)
- Manisa-Selendi; Gediz Basin; İlke Creek Integrated Microcatchment Rehabilitation Project (2018-2022)
- Burdur -Çavdır; Western Mediterranean Basin; Çavdır Dam Integrated Microcatchment Rehabilitation Project (2019-2023)
- Kütahya-Center; Sakarya Basin; Porsuk Dam-1 Integrated Microcatchment Rehabilitation Project (2019-2023)
- Eskişehir-Sivrihisar; Upper Sakarya Basin; Porsuk Stream Integrated Microcatchment Rehabilitation Project (2019-2023)
- Iğdır-Aralık Integrated Flood and Erosion Control Project (2019-2023)
- Ankara Province Beypazarı District; Upper Sakarya Basin Kargı Dam Integrated Microcatchment Rehabilitation Project (2020-2024)
- Eskişehir-Sivrihisar; Upper Sakarya Basin; Nasrettin Hoca Integrated Microcatchment Rehabilitation Project (2020-2024)

Picture 7 - Before and After of Denizli-Çameli; Karanfilli Çayı Stream Micro Basin

BEFORE

AFTER

F.6.3.1. National Basin Management Strategy (2014-2023)

The National Basin Management Strategy was prepared with the contribution of the relevant institutions and organizations under the coordination of the Ministry of Agriculture and Forestry, to show a common path to the activities to be carried out to ensure adequately and sustainably the ecological, economic, social benefits and services of water basins. It was approved by the High Planning Council on 13.06.2014 and entered into force after being published in the Official Gazette No. 29050 dated 04.07.2014.

F.6.3.2. Basin Monitoring and Evaluation System

Feasibility reports were prepared within the scope of the "Development of Basin Monitoring and Evaluation System Project", the necessary criteria and indicators were determined for carrying out monitoring activities regarding the themes of "soil erosion and mass movements", "desertification" and "soil organic carbon" in the light of these reports, and the relevant models were established. Furthermore, the "land-use" theme studies have been in progress under the National Land Cover / Use Classification and Monitoring System project initiated at the end of 2018.

Map 27 – Basin and Sub-basins in Turkey
(Ministry of Agriculture and Forestry, 2020)

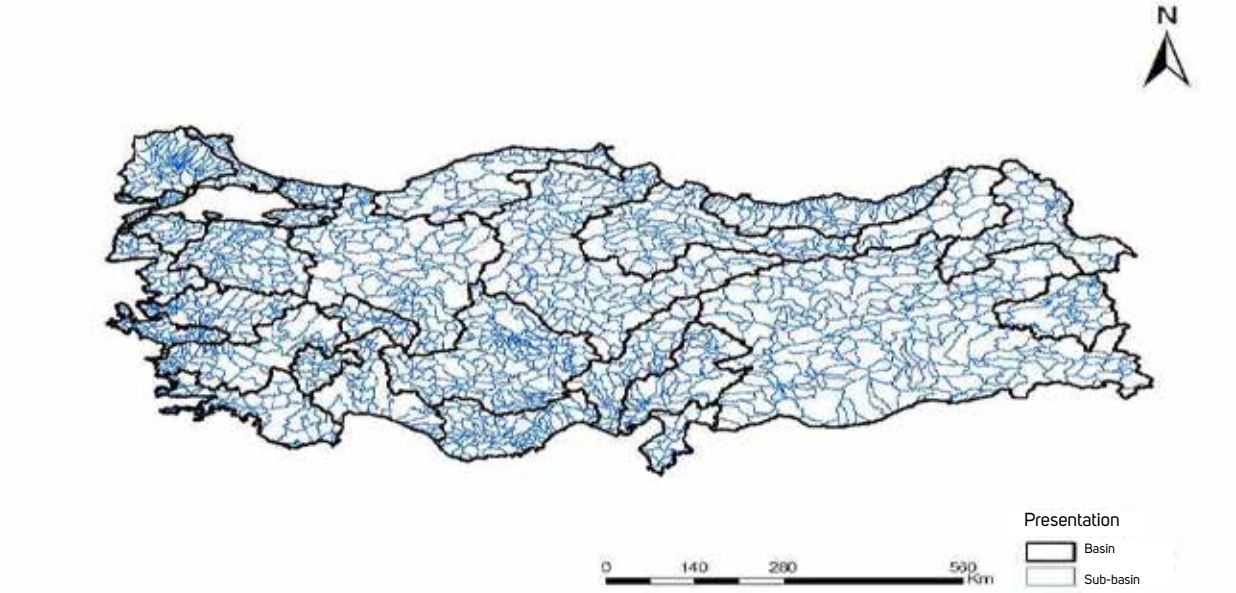


Figure 2 - Interface of Basin Monitoring and Evaluation System
(Ministry of Agriculture and Forestry, 2020)

F.7. Forest and Nature Conservation Policies and Developments

F.7.1. Forest Conservation

Fires are responded to with 21 thousand personnel, 776 fire watchtowers and 1,140 forest fire first responders across the country. An average of 2,477 forest fires occurred annually in the last 10 years covering the years 2010-2019 in our country and an average of 7,330 hectares of forest was damaged annually in these fires. 88% of forest fires occurred in the fire season covering the months of May - November, and 12% of them occurred from December to April.

2,662 forest fires occurred as of 28 September 2020. 11,989 hectares of forest area were damaged in these fires. 1,989 forest fires occurred, and 9,371 hectares of forest area were damaged in these fires during the same period, as of 28 September 2019. This year, there has been an increase of approximately 34% in the number and area of fires and 28% in the burning area compared to the previous year.

When compared to Mediterranean countries with similar forest structure and similar climate zone with our country, it is seen that Turkey is one of the most successful countries in combating forest fires according to the figures of The European Forest Fire Information System-EFFIS reporting fire data.

Table 96 - Information Comparison of the European Forest Fire Information System (General Directorate of Forestry, 2020)

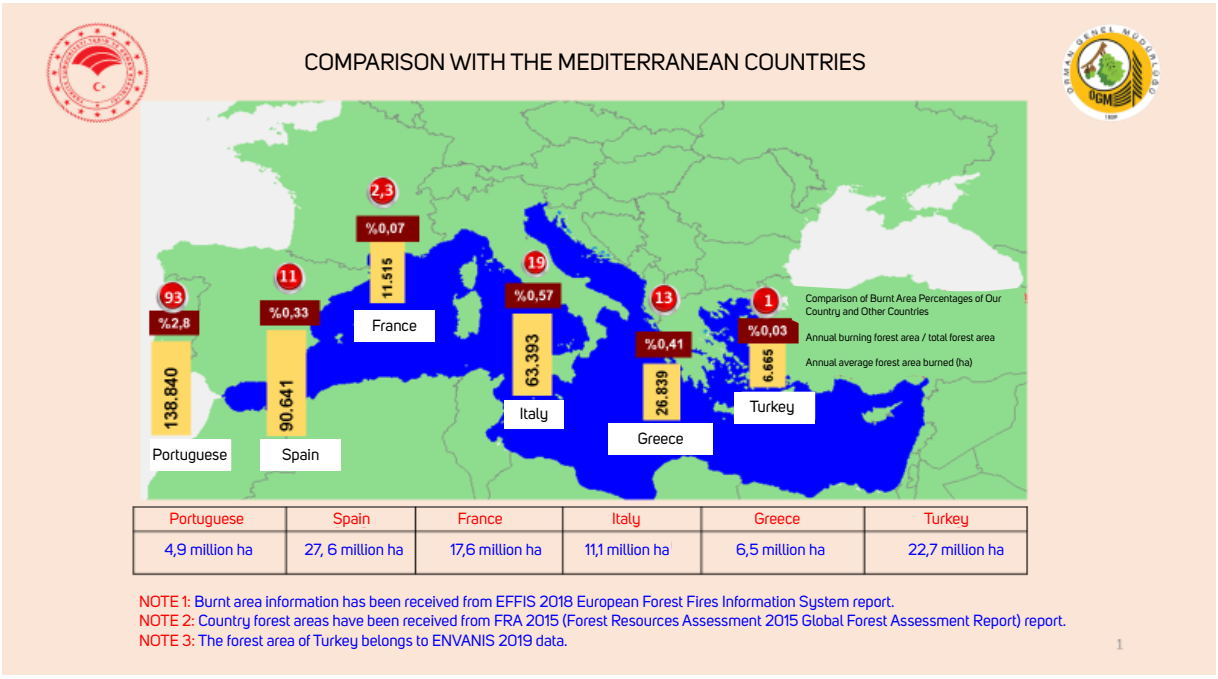
EUROPEAN COUNTRIES EFFIS INFORMATION COMPARISON												
COUNTRY	Portuguese		Spain		France		Italy		Greece		Turkey	
Years	Area/ha	Number	Area/ha	Number	Area/ha	Number	Area/ha	Number	Area/ha	Number	Area/ha	Number
2009	87.416	26.119	110.783	15.643	17.000	4.800	73.355	5.422	35.342	1.063	4.679	1.793
2010	133.090	22.026	54.770	11.721	10.300	3.900	46.537	4.884	8.967	1.052	3.317	1.861
2011	73.813	25.221	84.490	16.414	9.400	4.500	72.004	8.181	29.144	1.653	3.612	1.954
2012	110.231	21.176	209.855	17.503	8.600	4.105	130.814	8.252	59.924	1.559	10.455	2.450
2013	152.756	19.291	54.170	10.626	3.608	2.223	29.076	2.936	46.676	862	11.456	3.755
2014	19.929	7.067	19.929	9.771	7.493	2.778	36.125	3.257	25.846	552	3.117	2.149
2015	64.443	15.851	103.200	11.928	11.160	4.440	41.511	5.442	7.096	510	3.219	2.150
2016	161.522	13.261	65.817	8.817	16.093	4.285	47.926	5.818	26.540	777	9.156	3.188
2017	540.630	21.002	178.234	13.793	26.378	4.403	137.103	7.855	13.393	1.083	11.993	2.411
2018	44.578	12.273	25.162	7.143	5.124	3.005	19.481	3.220	15.464	793	5.644	2.167
10 years total ha	1388408	183287	906410	123359	115156	38439	633932	55267	268392	9904	66648	23878
10 years average ha	138840,8	18328,7	90641	12335,9	11515,6	3843,9	63393,2	5526,7	26839,2	990,4	6664,8	2387,8
Area per fire, ha	7,58		7,35		3,00		11,47		27,10		2,79	
FOREST AREA ha	4,9 Million		26,6 Million		17, 6 Million		11, 1 Million		6,5 Million		22,7 Million	
Burnt area / country forest area% in 10 years	28,33		3,28		0,65		5,71		4,13		0,29	

NOTE 1: Burnt area information has been received from EFFIS 2018 European Forest Fires Information System report.

NOTE 2: Country forest areas have been received from FRA 2015 (Forest Resources Assessment 2015 Global Forest Assessment Report) report.

NOTE 3: The forest area of Turkey belongs to ENVANIS 2019 data.

Graph 47 – Comparison of Burnt Area Percentages of Our Country and Other Countries (General Directorate of Forestry, 2020)



Forest fires have also increased in our provinces with increased population density, as forest fires are caused by approximately 90% of human activities.

F.7.2. Nature Conservation Policies

Çoruh River Basin Rehabilitation Project (2012-2021) has been carried out under the coordination of the General Directorate of Forestry for providing integrated basin rehabilitation including vegetation, soil, and water resources, improving the living conditions of the rural residents, protecting the soil, rehabilitation of degraded forests, prevention of natural disasters such as avalanche, flood in Artvin, Bayburt and Erzurum provinces located in the Çoruh River Basin

The General Directorate of Forestry Erosion carries out the control and pasture improvement activities. Erosion control, flood control, afforestation and pasture improvement activities were carried out within the scope of the Erosion Control Action Plan (2013-2019), which was initially put into practice between 2013-2017 but whose implementation period was extended for 2 years, Upper Basin Flood Control Action Plan (2013-2019) and Dam Basin Green Belt Afforestation Action Plan (2013-2019).

Table 97 - Erosion Control and Pasture Improvement Activities Between 2013-2019

Activity (ha)	Years						
	2013	2014	2015	2016	2017	2018	2019
Erosion Control	84,304	80,517	75,139	97,056	91,049	86,758	16,448
Pasture Improvement	7,968	10,114	9,635	9,920	16,383	20,518	8,088

Erosion control in 15,198 hectares of land, flood control in 1,250 hectares of land, pasture rehabilitation work in 8,088 hectares carried out in 2019. Moreover, afforestation and erosion control work carried out in 30 dams and ponds within the scope of the Dam Basins Green Belt Afforestation Action Plan (2013-2019), and Upper Basin Flood Control Action Work was carried out in 38 flood catchments within the scope of the Plan (2013-2019).

F.7.3. Memberships to International and Regional Organizations

F.7.3.1. Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE)

Forest Europe is regarded as a voluntary high-level political process to develop common strategies on sustainable forest management (including the conservation of forests) for the 46 European and European Union signatory countries. Forest Europe takes the highest level of political decisions to maximize the ecological, social and economic contribution of European forests on forestry sector and forest-related issues. Turkey played an active role in the issuance of a Madrid Ministerial Decision titled "The Future Direction of Forest Europe" at the FOREST EUROPE Seventh Ministerial Conference held in Spain in 2015 to prevent the draft European Forest Agreement, formed between 2012-2013, from remaining inconclusive.

F.7.3.2. European Forest Genetic Resources Programme (EUFORGEN)

EUFORGEN (European Forest Genetic Resources Program) was established in 1990 to protect European forests. Turkey became a member of the program in 2000 with the decision of the Council of Ministers numbered 2000/1234. Turkey participated in the 5th phase of EUFORGEN (2015-2019), which continues at the Pan-European level in line with Strasbourg Decisions 2 and FOREST EUROPE-related commitments. The 6th phase works will start as of this year.

F.7.3.3. OECD Forest Seed and Plant Scheme

"OECD Certification of Forest Reproductive Material Moving in International Trade ", shortly known as "OECD Forest Seed and Plant Scheme" was first established in 1974. The need to consider vegetative propagation and other new techniques was required in the 1980s. Therefore, the program was updated to greatly preserve the old program and to expand the scope of the old program in 1995/96.

F.7.3.4. European Forest Institute

The European Forest Institute (EFI) is an international organization established by the European States. 29 European States have ratified the EFI Convention. The EFI Council, which has around 130 related and affiliated organizations, consists of 11 country representatives.

F.7.3.5. International Union of Forest Research Organizations

The International Union of Forest Research Organizations (IUFRO) is one of the leading global networks in terms of collaboration between forestry sciences. IUFRO is a worldwide international organization dedicated to forestry research and related sciences and headquartered in Vienna. The non-profit organization, not affiliated with any country and non-discriminatory, has a history dating back to 1892. Poplar and Fast Growing, Forest Trees Research Institute, Central Anatolia Forestry Research Institute, Istanbul University Faculty of Forestry, Karadeniz Technical University Faculty of Forestry, Süleyman Demirel University Faculty of Forestry, Kastamonu University Faculty of Forestry are members of the organization in Turkey.

F.7.3.6. International Commission on Poplars and Other Fast-Growing Trees

Poplar and Fast Growing Forest Trees Research Institute under the General Directorate of Forestry serves as the focal point on behalf of our country in the International Commission on Poplars and Other Fast-Growing Trees. Turkey has been membership in this organization since 1964, and since it is a legal body of FAO, no payment has been made on behalf of our country.

Sources

Ministry of Environment and Urbanization
Ministry of Agriculture and Forestry
General Directorate of Forestry
Directorate General of Agricultural Researches and Policies

G. LAND USE

G. LAND USE

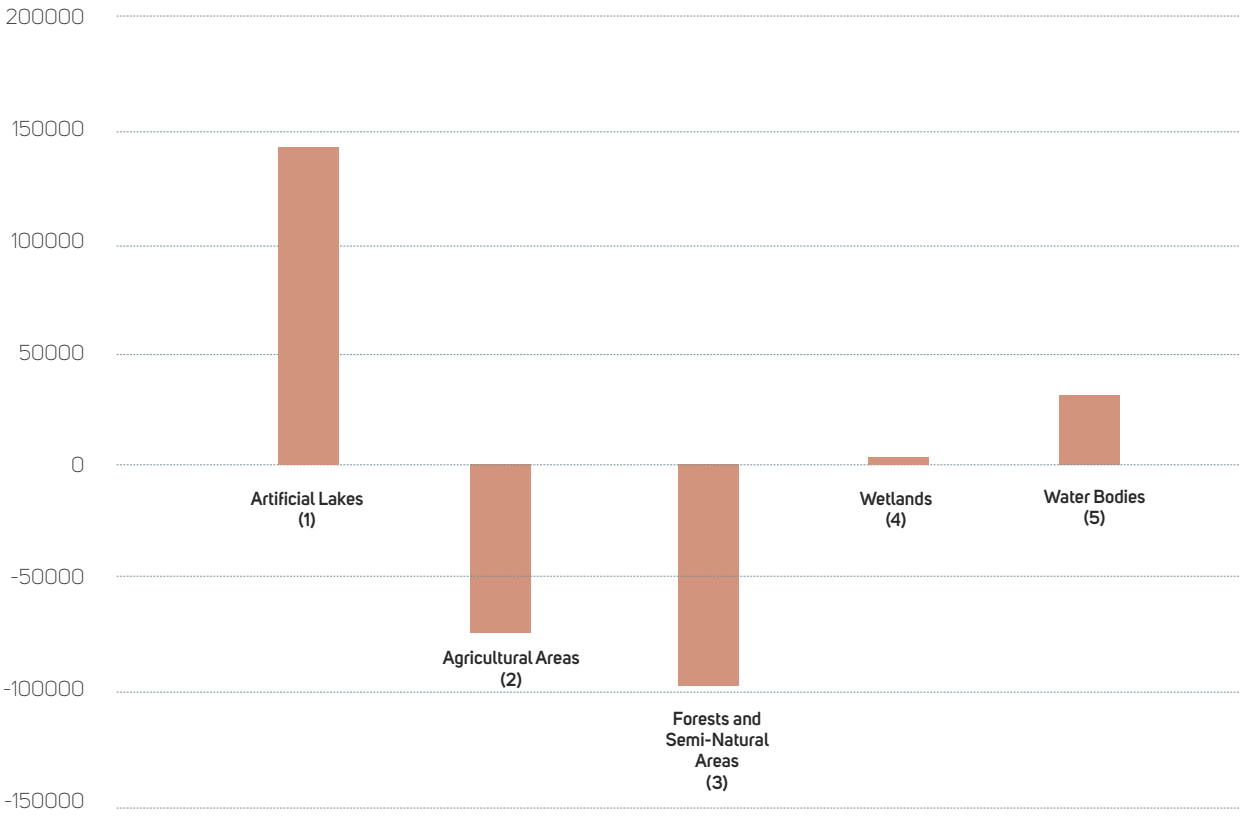
The term land cover is often used in conjunction with the definition of land use. But these two terms are not synonymous. Land cover refers to the vegetation cover and man-made structures on the earth. Land use, on the other hand, refers to human activities related to the land. The term land use is normally used in a related sense that includes both the cover types of the land and the actual use of the land, as opposed to the suitability of the land or the potential use of the land.

G.1. Land Use Data

Table 98 - Distribution of Land Use in Turkey **(https://corinecbs.tarimorman.gov.tr/,** 2020)

	2006		2012		2018	
	Area (ha)	Percentage (%)	Area(ha)	Percentage (%)	Area(ha)	Percentage (%)
1) Artificial Zones	1,300,589,00	1.61	1,456,764,95	1.81	1,565,407,01	1.94
2)Agricultural Areas	33,997,989,52	42.16	34,137,732,58	42.34	34,079,354,82	42.26
3) Forests and Semi-Natural Areas	40,985,568,14	50.83	40,643,583,57	50.4	40,564,303,45	50.31
4) Wetlands	417,587,84	0.52	412,519,01	0.51	413,786,96	0.51
5) Water Bodies	3,938,293,88	4.88	3,985,920,76	4.94	4,013,668,63	4.98
TOTAL	**80,640,028,38**		**80,636,520,87**		**80,636,520,87**	

Graph 48 – Change in the Distribution of Land Use in Turkey between 2012-2018 **(https://corinecbs.tarimorman.gov.tr/,** 2020)

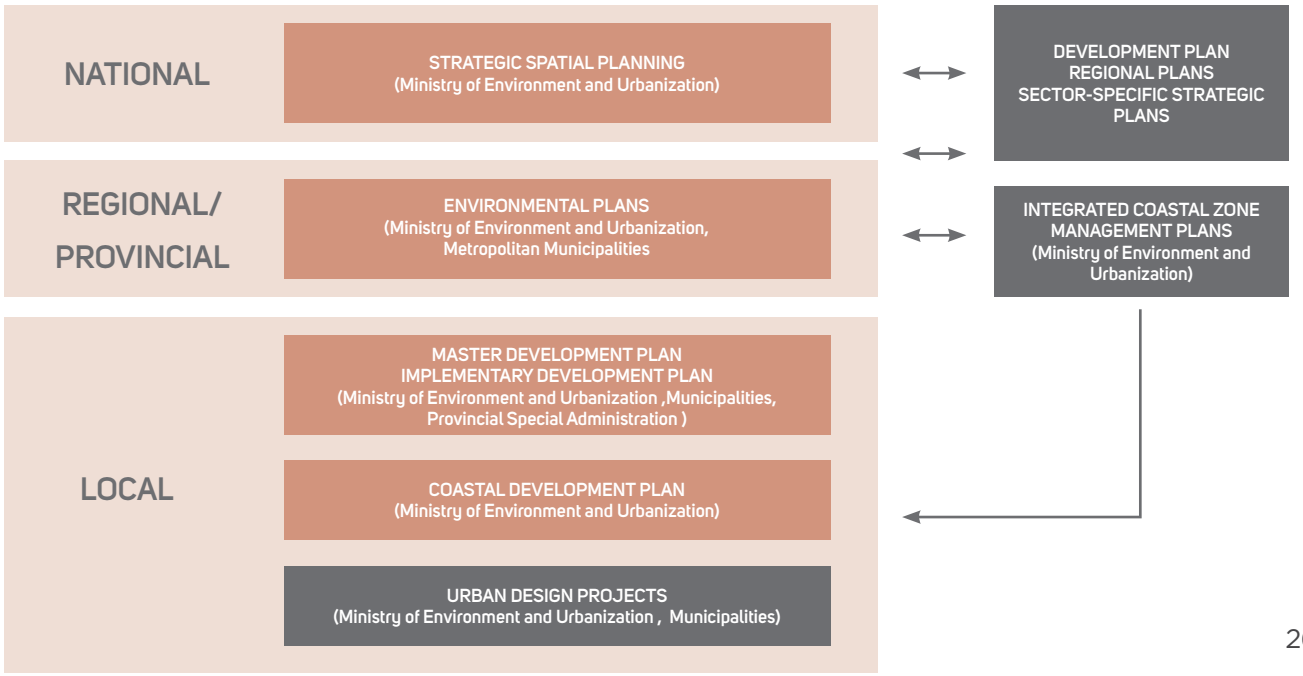


When compared the year 2012 and 2018 to examine the change in land use areas in Turkey according to CORINE data, it is seen that Agricultural Areas decreased by 74,514,53 ha, Forest and Semi-Natural Areas decreased by 97.871,23 ha, while Wetlands increased by 1,118,24 ha, Water Bodies increased by 30,247,58 ha and Artificial Zones increased by 141,019,95 ha.

G.2. Spatial Planning

Spatial Planning is the determination of land use and construction decisions to protect and develop physical, natural, historical, and cultural values, to ensure the balance of protection and use, to support national, regional, and provincial sustainable development, to create healthy and safe environments with high quality of life.

Figure 3 – Staging Between Spatial Plannings in the Framework of the Legislation in Turkey



G.2.1. Strategic Spatial Planning in Turkey (SSP of Turkey)

The duties specified in Article 97/d "to prepare the spatial strategy plans in cooperation with the relevant institutions and organizations and monitor the compliance of the plan decisions of the local administrations to these strategies" and in Article 102/a, "to prepare, have prepared, approve and implement the upper-scale spatial strategy plans and landscaping plans, directing settlement, construction and land use, and constituting the basis for physical plans and applications of all types and scales, in cooperation with the relevant institutions and organizations, and ensure that the implementation is carried out according to these strategies" of the Presidential Decree No. 1 have been assigned to the Ministry of Environment and Urbanization.

According to Article 5 of the Law No. 3194 on Land Development Planning and Control, "Spatial Strategy Plan is the plan that guides physical development and sectoral decisions by associating economic, social policies and environmental policies and strategies with space, prepared throughout the country and in regions deemed necessary, and is the whole plan with its report."

The preliminary and research studies regarding the SSP of Turkey were completed in line with the provisions of the aforementioned Law and the Presidential 100-Day Executive Program in 2018 by receiving consultancy from a 36-person group of experts from Istanbul Technical University. Analyzes and spatial evaluations were conducted in 2019, and so the vision, axis, and priorities, as well as the spatial development scenario of the plan, were put forward.

The preparation process of the national SSP of Turkey, which relates the economic, social, and environmental policies and strategies with space in achieving the development and growth goals of the country and realizing the future vision, ensures a balanced distribution of infrastructure and services in accordance with development policies for competitive cities, and which will guide spatial planning to create people-oriented, disaster-resistant, climate change-ready, identity, livable, and productive cities, was carried out under the

consultancy of Istanbul Technical University (ITU). Its preliminary preparation and research studies were completed in 2018 and its analyzes, spatial evaluations were made in 2019. Accordingly, the vision, axis and priorities, and the spatial development scenario of the plan were put forward.

Working Group Meetings, as well as High-Level Guidance Meetings, were organized with the participation of the relevant public institutions, local administrations, universities, non-governmental organizations and private sector as part of the preparatory work carried out in a participatory process.

The vision of SSP of Turkey targeting 2053 has been defined as: "Inclusive, livable, innovative, competitive, sensitive to climate change and disasters, durable and sustainable spaces".

Priorities have been set under 6 axes for the realization of the vision of SSP of Turkey.

These axes are;

1. Livable settlements, accessibility and mobility
2. Sustainability in natural structure, natural disasters and ecosystem services
3. Combating climate change
4. Competitiveness and attractiveness
5. Innovation and technology
6. Population dynamics and human development.

The priorities of the "2nd Sustainability in Natural Structure, Natural Disasters and Ecosystem Services" axis are the efficient use of natural resources, protection and effective management of basins (agriculture, water); setting out the natural disaster risks and resilience of settlements, the efficient, effective and widespread use of renewable energy resources, and the recycling and disposal of wastes. The priorities of the "3rd Combating Climate Change" axis are greenhouse gas emission, adaptation to climate change in sectoral decisions, and adaptation to climate change in land-use decisions. Current and future environmental policies and the impact and integration of economic and social policies are analyzed and monitored under all these headings.

Alternative spatial development scenarios were created in line with the determined vision and priorities, were assessed with all stakeholders, and the decision was given for maintaining the SSP of Turkey studies, to be continued in 2020 and 2021, within the scope of the " SSP Multi-Focus Development Scenario of Turkey".

The strategies shaped by high-scale principles and norms that ensure the balance of sustainable management, conservation, and use of land, in general, will be developed under the SSP of Turkey. The plan will guide on how and through which analysis detailed land-use decisions will be made.

Integrated evaluation and association of the climate and natural hazard risks that have occurred so far, integrated natural hazard risk analysis for the country space and determination of the vulnerabilities regarding the space of the country will be possible within the scope of the Plan as well as the impact analyzes to be made with the Strategic Environmental Impact Assessment.

It has been accepted as one of the basic principles to put forward all kinds of features and possibilities of the "place" and to consider the natural events that affect human life in the "Spatial Development Scenario", determined by "analytical evaluations, synthesis of the current situation and spatial evaluations" and developed to create an input for the SSP of Turkey. Exposing the possibilities and constraints of all-natural systems across the country, examining the needs of the settlements in this context, and making spatial decisions within this framework have been some of the main drivers in terms of natural hazards,

environmental health and durability of cities. In this context, the principle of protection from natural disasters and benefiting from natural resources and ecosystem services has been adopted for the whole country within the Spatial Development Scenario.

Figure 4 - Models of SSP Multi-Focus Development Scenario Schemes of Turkey

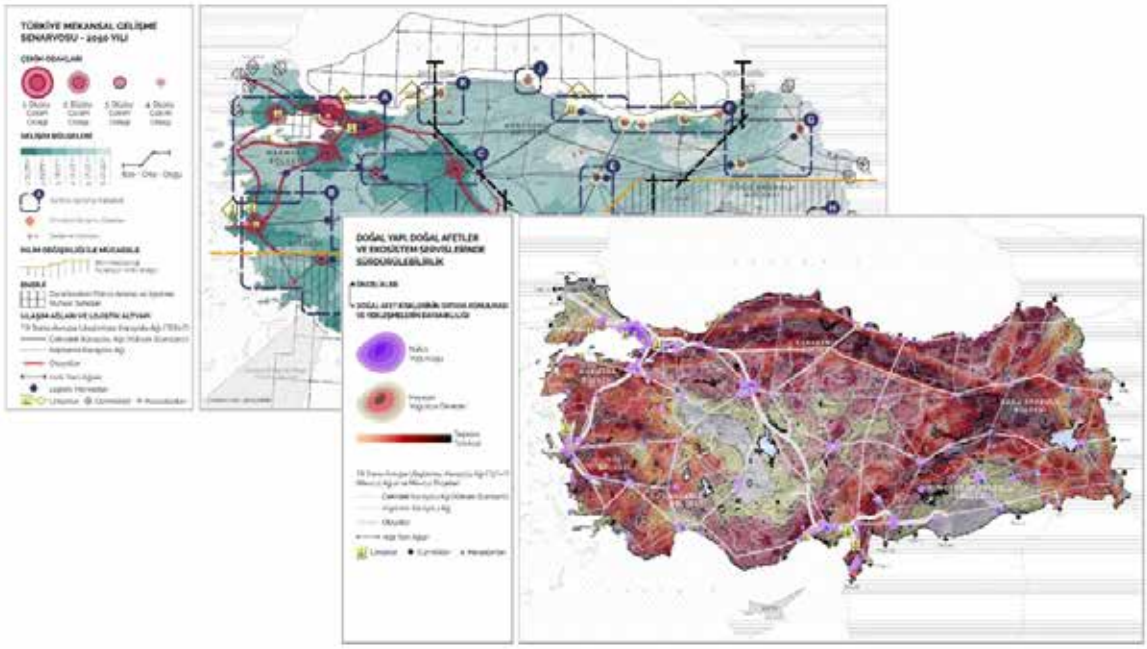
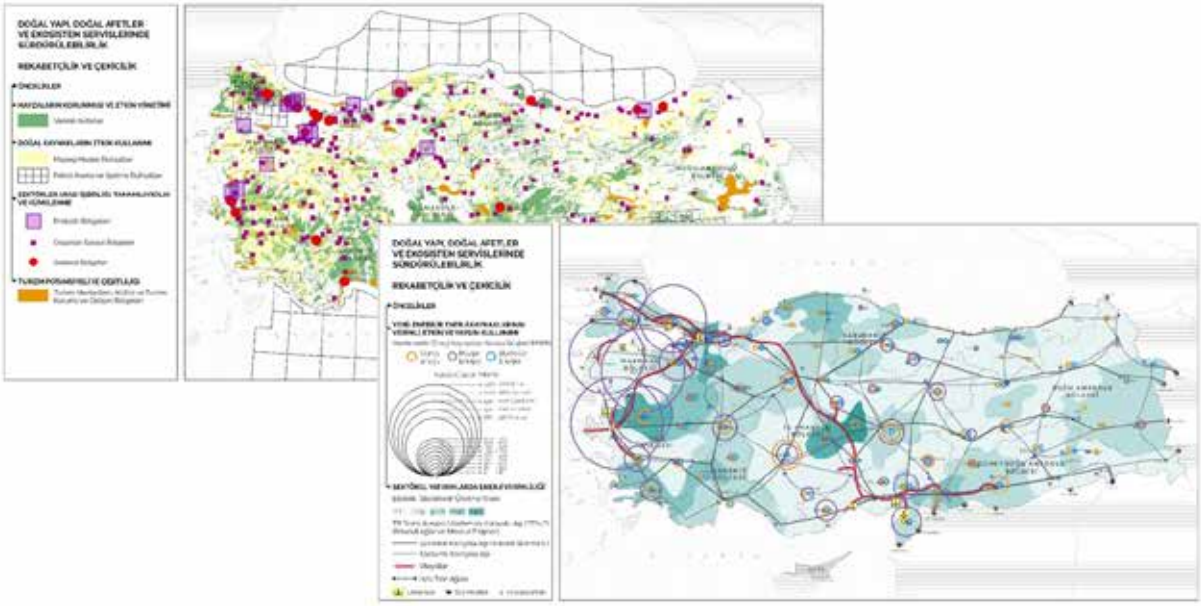


Figure 5 - Models of SSP Multi-Focus Development Scenario Schemes of Turkey



Analyzing the interaction between spatial development in our country and climate change, natural disasters, and the natural environment with the indicators based on spatial data, and then directing sustainably the sub-scale plans and physical development by revealing the spatial strategies and parameters are aimed under the SSP of Turkey which will be finalized in 2021 with the participation of all stakeholders, especially institutions/organizations.

G.2.2. Environmental Plan

The Ministry of Environment and Urbanization prepares the Environmental Plans, which are important components of spatial planning in the planning system in our country and guide the development plans to be prepared at sub-scales, within the framework of the duties and powers defined by the Presidential Decree No. 1 on the Organization of the Presidency. The boundaries of the Metropolitan Municipalities were determined as the provincial borders in accordance with "The Establishment of Fourteen Metropolitan Municipalities and Twenty-Seven Districts and Amendments at Certain Law and Decree Laws " within the framework of Article 102 of the same Decree. The works and processes related to the environmental planning in metropolitan cities are carried out by the metropolitan municipalities in accordance with the environmental plan decisions approved by the Ministry of Environment and Urbanization.

Environmental Plans are prepared and ratified in accordance with the procedures and principles defined under the By-Law on the Spatial Plans Construction published in the Official Gazette No. 29030 dated 14/06/2014. The Environmental Plan is the upper-scale physical plan that determines different/all kinds of land-use decisions such as settlement areas, housing, industry, agriculture, tourism, transportation in accordance with the spatial strategy plan decisions, if available.

Eliminating the lack of upper-scale planning throughout our country from past to present, eliminating the environmental and economic problems caused by rapid and uncontrolled urbanization, fragmentary and sectoral planning, ensuring the controlled development of urbanization and industrialization, and making the developments sustainable and balanced, preventing interventions that will disrupt the ecological balance and pose a threat to natural resources, prevention of environmental pollution before it occurs to reveal the importance of environmental plans.

The followings are aimed at the Environmental Plans;

- Determining the policies and strategies regarding protection and development,
- Directing urban and rural developments (social, economic, spatial) wholesomely by preventing irregular urbanization and industrialization,
- Conserving the sensitive areas and environmental values (coasts, forests, drinking and utility water basins, natural, cultural and historical values, etc.),
- Preventing the misuse of agricultural lands,
- Producing policy, strategy and land-use decisions to be the basis for sub-scale plans.

The Environmental Plans prepared by the Ministry of Environment and Urbanization with the perspectives below;

- Sustainable environment - sustainable development,
- Conservation of natural, historical and cultural environmental values,
- Prevention of environmental pollution,

- Structuring as a union (technical infrastructure solutions),
- Participation and transparency,
- Benefiting from technology.

Inquirable, updatable and applicable plans based on the database, using both environmental inventory, satellite images and geographic information systems (GIS) technology, are developed with a disciplined approach.

During the process of preparing Environmental Plans;

1- All the social, economic and natural data that will form the basis of planning are collected, the potentials, problems and possibilities of the planning area are determined by correlating these data with the other, demographical and sectoral analyzes are carried out, ecologically sensitive areas are determined through risk analysis and the synthesis map sheets required for the issues are prepared (analysis and synthesis).

A *comparable, assessable, inquirable, improvable, updatable, standard database* is created by using geographical information system and present data and data from land elevation models, satellite images and field surveys.

Figure 6 - Model of Detailed and General Satellite Images Used in Planning Studies

Figure 7 - The Model of Geographical Database Developed in Planning Studies

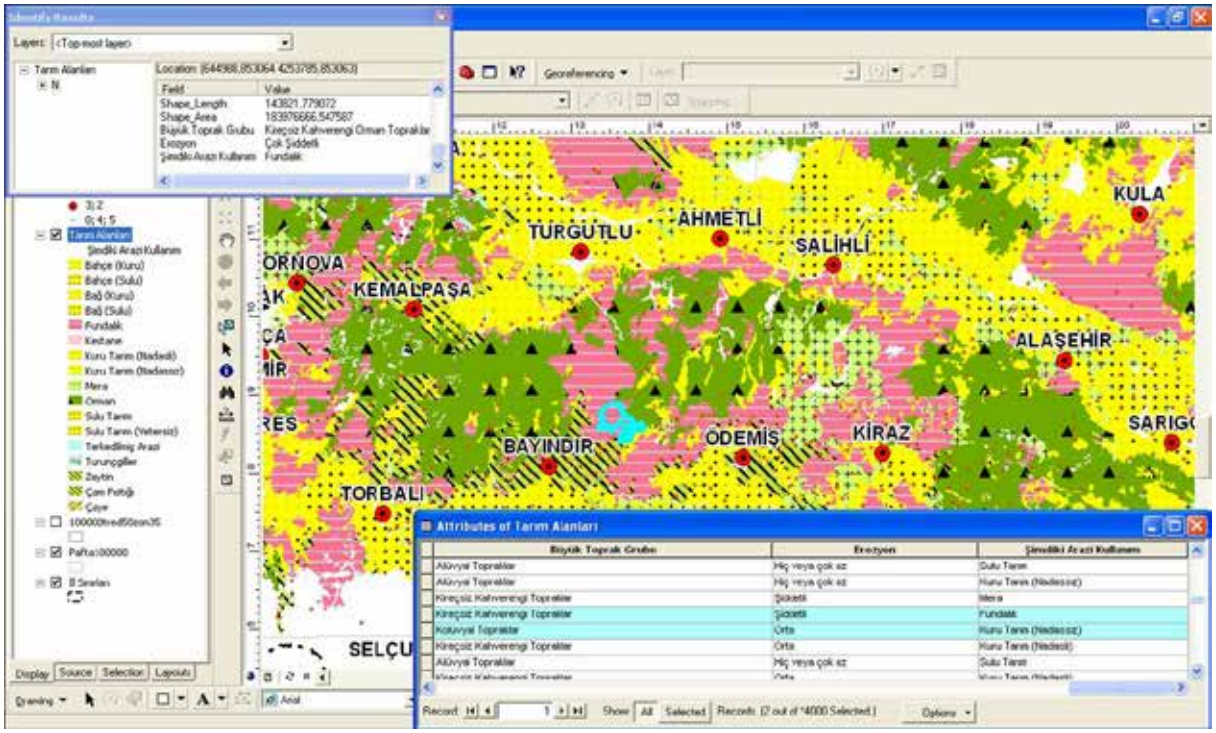
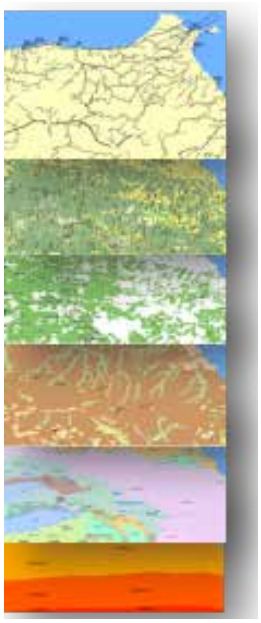


Figure 8 - Geographical Data Layers Used in Planning Studies



Transportation

Land

Forest

Morphology

Geology

Earthquake

IRS Satellite Image
IKINOS Satellite Image

Satellite Image

Risk Areas

Flora

Technical Infrastructure

2- By, development scenarios for each alternative plan and general land-use decisions are developed by preparing plan alternatives

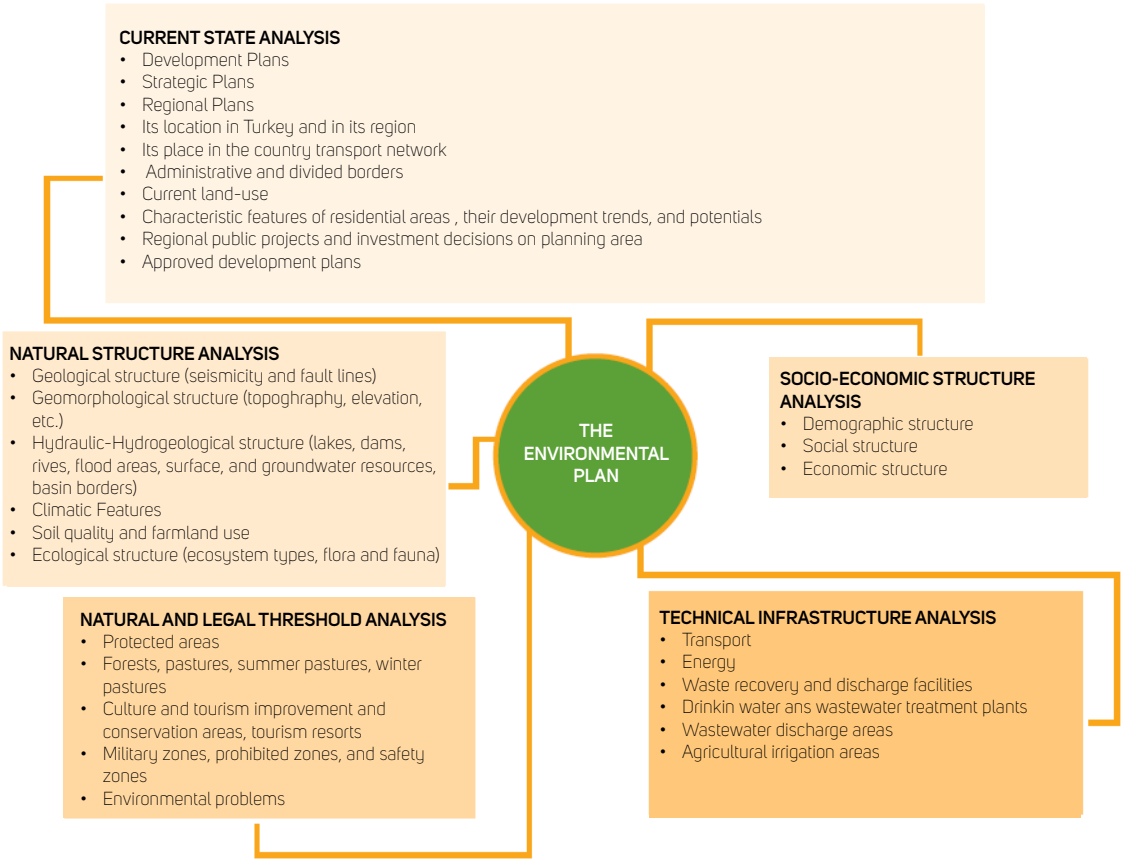
3- The final version of the Environmental Plan prepared at the end of all these stages include:

- Population acceptance and sectoral projections (Target year: 20 years),
- Those that will be needed according to the current and accepted population:
    - Urban Land-Use, (Urban settlements, urban development areas, industry, storage areas, non-residential urban activity areas)
    - Rural residential areas and utilization decisions,
    - Tourism areas and utilization decisions in line with area potentials,
- Those that have been determined within the frame of investments by related institutions and will be needed during the implementation of the plan:
    - Transportation (land transport, railway transport, maritime transport elements)
    - Education,
    - Energy,
    - Land use decisions and strategies regarding waste treatment and waters,
- Within the framework of data obtained from institutions
    - Farmlands,
    - Forest Areas,
    - Military Zones,
    - Protected Areas,
    - Utilization Decision determined within the framework of the Areas of Drinking and Utility Water Protection Belts etc. and related laws.
- Areas determined by special laws:
    - National Parks,
    - Nature Conservation Areas,
    - Wildlife improvement areas,
    - Tourism protection and improvement areas and directions to related laws and plans/projects,

4- The environmental plan is an upper-scale physical plan where we can see the areas to be protected and the decisions regarding these areas, although there is no legal protection status in terms of natural/ ecological terms.

5- The plan layouts showing the decisions regarding the spatial reflections of the determined policies, strategies and scenarios, the Plan Explanation Report in which the plan scenario, land use patterns and distributions are explained together with the justifications within the framework of the strategy and policies, and the plan provisions describing the implementation, where the land-use decisions and construction conditions are specified are indivisible and these documents make up the Environmental Plan.

Figure 9 - Issues in the Analysis and Synthesis of the Environmental Plan



G.2.2.1. Nationwide Environmental Plans

1/100,000 Scale Environmental Plans have been approved for 19 Planning Areas by the Ministry of Environment and Urbanization between 2005 and 2020. These provinces are provided below:

- Adıyaman-Şanlıurfa-Diyarbakır Planning Area 1/100,000 Scale Environmental Plan
- Antalya-Burdur-Isparta Planning Area 1/100,000 Scale Environmental Plan
- Ardahan-Kars-Iğdır-Ağrı Planning Area 1/100,000 Scale Environmental Plan
- Aydın-Muğla-Denizli Planning Area 1/100,000 Scale Environmental Plan
- Balıkesir-Çanakkale Planning Area 1/100,000 Scale Environmental Plan
- Erzurum-Erzincan-Bayburt Planning Area 1/100,000 Scale Environmental Plan
- İzmir-Manisa Planning Area 1/100,000 Scale Environmental Plan
- Kırşehir-Nevşehir-Niğde-Aksaray Planning Area 1/100,000 Scale Environmental Plan

- Konya-Karaman Planning Area 1/100,000 Scale Environmental Plan
- Malatya-Elazığ-Bingöl-Tunceli Planning Area 1/100,000 Scale Environmental Plan
- Mardin-Batman-Siirt-Şırnak-Hakkâri Planning Area 1/100,000 Scale Environmental Plan
- Mersin-Adana Planlama Planning Area 1/100,000 Scale Environmental Plan
- Muş-Bitlis-Van Planlama Planning Area 1/100,000 Scale Environmental Plan
- Ordu-Trabzon-Rize-Giresun-Gümüşhane-Artvin Planning Area 1/100,000 Scale Environmental Plan
- Samsun-Çorum-Tokat Planning Area 1/100,000 Scale Environmental Plan
- Sinop-Kastamonu-Çankırı Planning Area 1/100,000 Scale Environmental Plan
- Tekirdağ-Kırklareli-Edirne (Thrace Sub-Region Ergene Basin) Planning Area 1/100,000 Scale Environmental Plan
- Yozgat-Sivas-Kayseri Planning Area 1/100,000 Scale Environmental Plan
- Zonguldak-Bartın-Karabük Planning Area 1/100,000 Scale Environmental Plan

Apart from these, 1 / 100,000 scale environmental plans were prepared and approved by the Ministry of Environment and Urbanization, and upper-scale plans of 63 provinces in total, including Amasya and Kilis provinces, are in effect.

Map 28 - Situation in Environmental Plans Across the Country
(Ministry of Environment and Urbanization, 2020)

1 / 100.000 scale environmental plans of 17 provinces, of which efforts are carried out and approved by the relevant administrations are also in force. These provinces are;

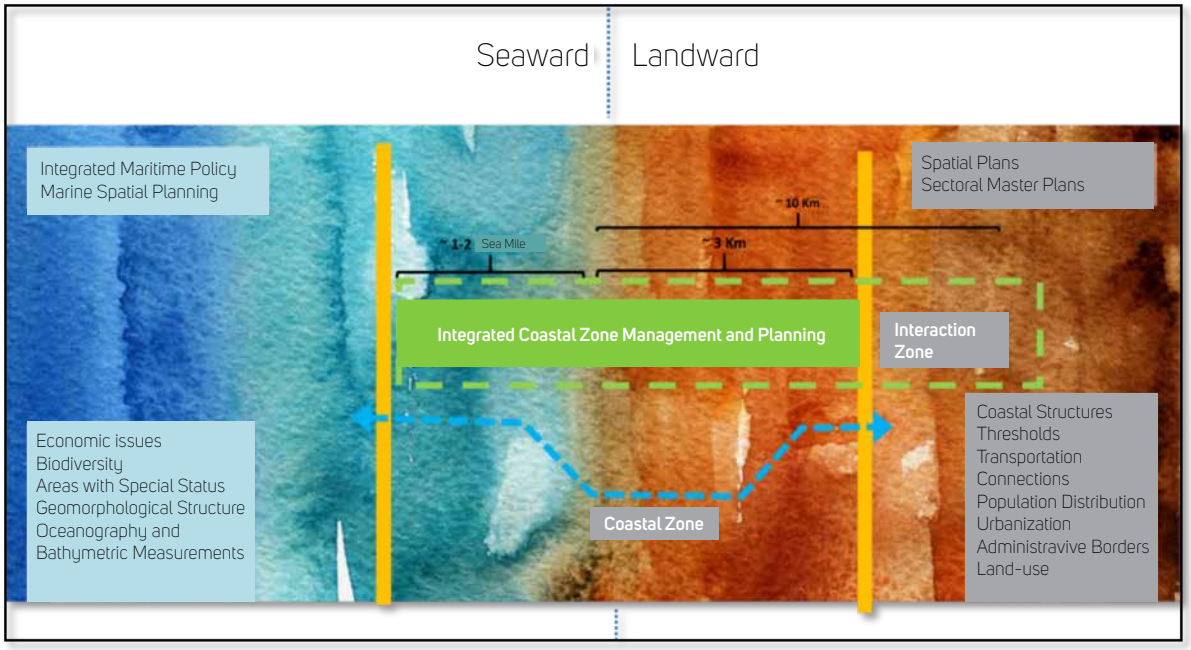
İstanbul	Düzce	Kırıkkale
Kocaeli	Bilecik	Uşak
Bursa	Bolu	Afyonkarahisar
Yalova	Eskişehir	Kahramanmaraş
Sakarya	Ankara	Osmaniye
Gaziantep	Hatay	

Environmental plans, which direct settlement, construction and land use and constitute the basis for sub-scale plans and applications, have been completed in 80 provinces across the country as of today, and the entire territory of the country will be planned with the approval of the Afyonkarahisar Uşak-Kütahya Planning Region 1 / 100,000 Scale Environmental Plan by the Ministry of Environment and Urbanization and its entry into force.

1 / 100,000 Scale Environmental Plans, prepared by the Ministry of Environment and Urbanization, are published on the page of the Directorate General of Spatial Planning at http://www.mpgm.csb.gov.tr.

G.2.3. Integrated Coastal Zones Plan

It is important to consider the spatial planning system from a holistic perspective and to clarify the national spatial strategies. It is among the important objectives of the Ministry of Environment and Urbanization to put forward the procedures and principles of the planning system at the highest level and to prepare targets and strategies based on both urban development and rural planning, as well as coastal zones and regions.



For this reason, the project activities regarding the coasts of our country on examining the coastal areas management understanding by reviewing the international models and accordingly, the rearrangement of the coastal legislation has been in progress since 2007 to ensure the balanced and regular utilization of the coastal areas for the coasts by being conserved.

Bringing a new approach to coastal planning and implementation activities in our country, making holistic decisions by looking at the upper scale instead of point decisions, making strategic decisions to solve the problems experienced including the implementation process and management dimension as well as the physical planning and obtaining activities that will ensure the use of the coast by considering the balance of protection and use are aimed within the scope of these activities.

The integrated coastal areas plans are the plans prepared in cooperation with the relevant institutions and organizations within the framework of the strategic planning approach as a whole with the plan sheet and planning report, in accordance with the language of 1/25,000 or 1/50,000 scale schematic and graphical planning. They address plans, coasts, all sectoral activities and plans together with their interaction zones, with an integrated approach so to include sectoral activities and plans as well as all the social and economic issues with an integrated approach, include spatial goals, strategies and action recommendations and a management plan so to balance protection and use.

G.2.3.1. Our International Obligations in Integrated Coastal Zone Plans

Our country is one of the 21 countries that are members of the Mediterranean Action Plan (MAP) (The United Nations Environment Programme (UNEP). The Ministry of Environment and Urbanization runs the focal point of Priority Actions Programme/Regional Activity Centre (PAP/RAC), which is one of the MAP Regional Activity Centers and works on the integrated management of coastal zones.

Map 29 – Bursa Province Integrated Coastal Zone Plan
(Ministry of Environment and Urbanization, 2020)

The harmonization preparation activities regarding the Protocol on Integrated Coastal Zone Management in the Mediterranean (ICZM), the last of 7 Additional Protocols of the Barcelona Convention - The Convention for the Protection of the Marine Environment and Coastal Region of the Mediterranean, which our country has also signed but hasn't been a party to yet.

G.2.3.2. Environmental and Climate Change Adaptation in the Integrated Coastal Zone Plans

As far as is known, life in the marine environment produces one-third of the oxygen we breathe, provides valuable protein and balances global climate change. Coastal ecosystems are special ecosystems as rapid transition zones (ecotone) where marine and land ecosystems intersect. Since coastal zones with high eutrophication risk in the new integrated coastal zone plans are also high-risk areas against climate change, attention should be paid to coastal projects in these zones.

In the new integrated coastal zone plans completed in the last five years; policies, strategies and actions have been developed for the regions defined in the Plan against the climatic events such as sea-level rise, flood and flood potential, storm wave, river overflow in the context of climate change adaptation and mitigation approach in coastal zones. Accordingly, the zones areas sensitive to climate change have been determined and classified in the plans. Medium and long-term projections have been made for the zones exposed to disaster risks such as floods, floods and sea level rise with mappings made using Geographical Information Systems.

Another means for healthy and sustainable spatial development is environmental assessment methods. The Strategic Environmental Assessment method applied by the European Union is used to evaluate the environmental impacts of large-scale plans and programs. The Strategic Environmental Assessment method is a method in which the significant impacts of the plan or program on the environment are determined. This process is not a decision-making process in itself but a process that develops with and supports the decision-making process. It is the analysis and evaluation of the permanent or temporary potential impacts of new projects and developments on the environment, including their social consequences and alternative solutions. With this method, the plan or program is supported by the feedback method.

The recently developed integrated coastal zone plans are subject to the strategic environmental assessment process and both processes have started to be carried out together.

G.3. Legislative Regulations and Developments on Land Use

Law No. 3194 on Land Development Planning and Control is a general and fundamental law that includes regulations on land use. The law includes procedures and principles on planning and implementation issues such as mapping, planning, development activities, building license, occupancy permit, inspection, penalty, etc.

In the amendment made with Law No. 7153 dated 29.11.2018 the definition of "*Spatial Strategy Plan*", which guides physical development and sectoral decisions by correlating economic, social policies and environmental policies and strategies with space, was included and spatial planning stages were redefined as "*landscaping plans, master development and implementation development plans in accordance with spatial strategy plans*".

Having bicycle lanes and bicycle parking stations for transportation purposes in accordance with the procedures and principles determined by the Ministry of Environment and Urbanization and in the whole plan has been an obligatory act in new development plans to be prepared and approved for the zones of which development plans haven't been implemented and arrangement of pedestrian roads in places where bicycle paths cannot be made due to topography and terrain slope has been predicted as of 01.06.2019 with the new article added in the same amendment.

Apart from the Law on Land Development Planning and Control, the "By-Law on Spatial Planning" entered into force on 14 July 2014 to designate the procedures and principles regarding the preparation of spatial plans that are prepared for protecting and improving physical natural, historical and cultural values, providing a balance between conservation and utilization and supporting sustainable development on a national, regional and provincial scale and providing healthy and safe environments and bringing decisions on structuring.

With the article added in the amendment made with Law No. 7221 dated 14.02.2020, a by-law has been made that "plan changes" increasing the population, building density, the number of floors and building height cannot be made on a parcel basis. Furthermore, it is envisaged that the whole of the increased value of the land with an increase in value will be taken as the value increase share and the return of the increased value to the public will be provided as a result of the plan change that envisages the changes of the population, building density, number of floors, building height or function on an island basis, provided that it is not less than one thousand square meters.

The coastal zones are special quality areas that should be used for public benefit, provided that the balance of protection and use is maintained. In this context, while article 43 of the Constitution stipulating the use of coasts and coastlines, which are extensions of the coasts, it also judges that this use must be provided within the framework of protection and public interest.

The Coastal Law No. 3621, which entered into force in accordance with Article 43 of the Constitution, was enacted to define the principles of public use that are open to the public benefit to protect the sea, natural and artificial lakes and streams coasts and the coastlines that are under the influence of these places as extensions of them, taking into account the natural and cultural characteristics.

On the other hand, By-Law on the Implementation of the Coastal Law includes the sea, natural and artificial lakes and stream coasts and coastlines, the possibilities and conditions of benefiting from these places for the public interest, the principles of planning and structuring on the coasts and coastlines, the principles of land acquisition and use by filling and drying as well as the organization, duties and powers, the way of working of the coastal line determination commission, and the principles clarifying the implementation of the Law.

There are restrictions regarding the use of the coasts and the land acquisition by filling in the water areas to ensure the protection-use balance of the coast within the framework of this constitutional principle and the Coastal Law No. 3621 and its related By-Law.

Since the use of coastal and water areas is the structuring that might only come up for the public benefit within the framework of the coastal legislation, a requirement or obligation is sought for filling in the water. There must not be a more suitable option for the use in question to fill /dry e the coastal areas to be used. It is impossible to open the coastal and water areas to construction in some cases, due to the coastal legislation. For example, drinking and utility water sources cannot be subject to filling. Filling and drying cannot be implemented in areas designated as wetlands and protected by legislation or international agreements.

Construction of the infrastructure and facilities for the use of the coast for the public benefit and for protecting the coast, as well as structures and facilities that are not possible to be built anywhere else from the shore are allowed under the relevant provisions of the Law and Implementation By-Law.

Furthermore, Integrated Coastal Zone Plans are prepared in accordance with the By-Law on Spatial Planning in line with Presidential Decree No.1. The definition and principles of the Integrated Coastal Areas Plan have been described and the Integrated Coastal Areas Plan has been defined as a plan that is not included in the spatial planning stage, prepared with a strategic approach specific to the coastal and interaction area, and guides the zoning plans

Resources

Ministry of Environment and Urbanization

Ministry of Agriculture and Forestry

H. ORGANIZATIONAL STRUCTURE AND ACTIVITIES OF THE MINISTRY OF ENVIRONMENT AND URBANIZATION

H. ORGANIZATIONAL STRUCTURE AND ACTIVITIES OF THE MINISTRY OF ENVIRONMENT AND URBANIZATION

H.1. Organizational Structure

The concepts of environmental protection and environmentalism have started to be emphasized more with the awareness that the environmental pollution experienced around the world has started to exceed national borders, reached a level that could threaten the future of humanity, and that natural resources are not unlimited.

The issue of protecting the environment and natural balance has been on the agenda of Turkey since the early 1970s.

The increase in environmental problems in the world forced the nations to take action for the protection of the environment and the first United Nations Conference on the Human Environment took place in 1972 in Stockholm with the participation of 113 countries.

The most important feature of this conference is that it has been the first big conference on the environment in which countries with significant differences in terms of economic development level, social, cultural and political structures have come together.

An institutional and legal structure started to be formed to respond to international developments after the Stockholm Conference. In this context, a unit was assigned on environmental problems under the Ministry of Development and Housing.

The first independent structuring in the field of the environment was realized with the establishment of the "Environmental Problems Coordination Committee" consisting of six ministers under the presidency of the Minister of Energy and Natural Resources with Council of Ministers Decree No. 7/5836 dated 12.02.1973. This committee was later transformed into a "Coordination Committee for Environmental Affairs" with Decree No. 7/8329 dated 16.04.1974.

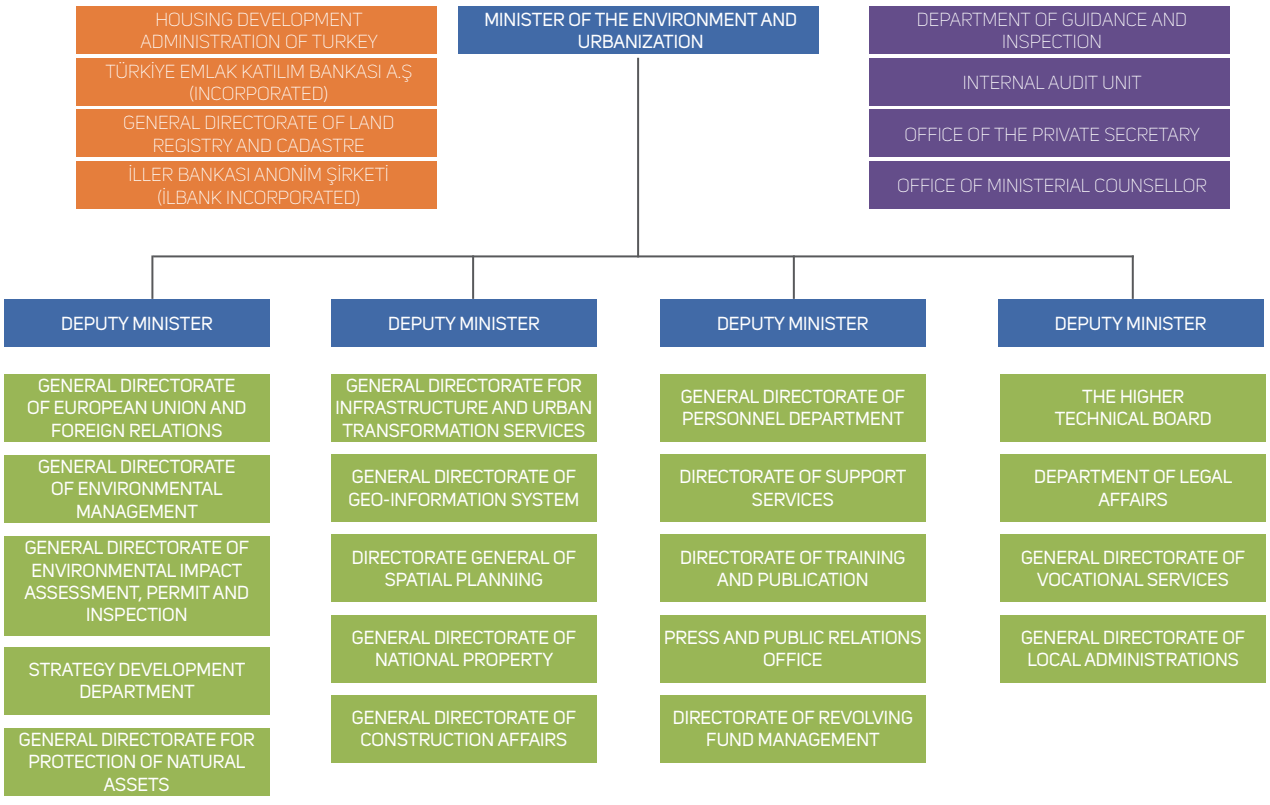
"Prime Ministry Environment Organization" was established with the decision of the Council of Ministers No. 7/16041 dated 27.07.1978 to determine fundamental policies for the protection of the environment, to prepare plans and projects related to the issue, and to ensure coordination between relevant ministries and organizations on the implementation of them. This organization is comprised of the "Undersecretariat of Environment", "Higher Board of Environment" and Technical Review Commission.

Activities on the prevention of environmental pollution were included in the 4th Five-Year Development Plan prepared in 1979 and the Undersecretariat of Environment was established under the Ministry. The Undersecretariat has been charged with conducting and supervising environmental policies and ensuring coordination between national and international organizations.

As it is known, Article 56 of the 1982 Constitution the Republic of Turkey states that everyone has the right to live in a healthy and balanced environment. It is the duty of the State and citizens to improve the natural environment, to protect the environmental health and to prevent environmental pollution." The Right to a Healthy Environment" has been guaranteed by the Constitution for the first time under this article of the Constitution. In this direction, Environmental Law No. 2872 dated 09.08.1983, entered into force in 1983, also imposed duties of taking part in environmental protection and improvement on both state and the citizens.

Environmental Law No. 2872, dated 09.08.1983, entered into force to address environmental issues in an integrated manner. The organization established in 1978 was abolished and the General Directorate of Environment was established as an institution affiliated to the Prime Ministry, with a legal entity and an additional budget, under the Decree-Law No. 222 dated 08.06.1984 and it was held liable for implementing the Environment Law.

Figure 10 – Organizational Structure of the Ministry of Environment and Urbanization (September 2020)



Since the General Directorate of Environment did not respond to the requirements of the country in the changing time, this General Directorate was transformed into the "Undersecretariat of Environment" in 1989. (Decree No. 389 in the OG No. 20337 dated 9 November 1989).

Agency on Specially Protected Environment Areas was established, with a legal personality as another institution related to environmental protection under the Decree-Law No. 383 dated 19.10.1989, to take measures to protect environmental values and solve environmental problems in places that have been or will be declared as Specially Protected Environment Area by the Council of Ministers according to Article 9 of the Environment Law, to make development plans, to revise plans and plan decisions of all scales and to approve them ex officio.

Later, the Ministry of Environment was established in 1991, since the necessity to fight environmental problems in the way of taking preventive measures instead of remedial measures by addressing the environmental right with a modern approach adopted in many developed countries (Decree-Law No. 443 in the OG dated 09.08.1991).

The Ministry of Environment and Forestry was established by combining the Ministry of Environment with the Ministry of Forestry with Law No. 4856 published in the Official Gazette No. 25102 dated 08 May 2003.

The Ministry of Environment and Urbanization was established with the Decree-Law No. 644 on the Organization and Duties of the Ministry of Environment and Urbanization, published in the repeated Official Gazette No. 27984 dated 04.07.2011. The Ministry of Environment and Urbanization was established by bringing together the environmental wing of the abrogated Ministry of Environment and Forestry and abrogated the Ministry of Public Works and Settlement under a single roof and the duties, power and responsibilities of the ministry were strengthened by the Decree-Law No. 648 published in the Official Gazette No. 28028 dated 17.08.2011.

The organization, duties, and powers of the Ministry of Environment and Urbanization were reorganized with the Presidential Decree No. 1 on the Presidential Organization published on 10.07.2018 following the transition to the Presidential Government System. It consists of the central and provincial organization of the Ministry and affiliated and related institutions (Mass Housing Administration-TOKI (Governmental Mass Housing Administration) Presidency, Emlak Katılım Bankası, General Directorate of Land Registry and Cadastre, İller Bankası AŞ).

H.2. Environmental Legislations

H.2.1. Laws

Environmental Law No. 2872

Law No. 2863 on Conservation of Cultural and Natural Property

Coastal Law No. 3621

Law No. 3194 on Land Development Planning and Control

Law No. 5312 Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances

Decree-Law No. 644 on the establishment and duties of the Ministry of Environment and Urbanization

Decree-Law No. 648 on amendments to Decree-Law No. 644 on the establishment and duties of the Ministry of Environment and Urbanization and to some Decree-Laws

Decree-Law No. 383 on the Establishment of an Environmental Protection Institution

H.2.2. By-Laws

CHAIN OF ENVIRONMENTAL COMPLIANCE

By-Law on Environmental Impact Assessment

By-Law on Environmental Permit and License

By-Law on the Control of Major Industrial Accident

By-Law on Environmental Inspection

ENVIRONMENTAL QUALIFICATION

By-Law on Environmental Management Services

By-Law on Environmental Labeling

By-Law on Environmental Measurement and Analysis Qualification

ZERO WASTE AND WASTE TREATMENT

By-Law on Control of Packaging Wastes

By-Law on the Control of Waste Electrical and Electronic Equipment

By-Law on Control of Waste Batteries and Accumulators.

By-Law on Waste Oil Management

By-Law on Organized Landfilling of Waste

By-Law on Incineration of Waste

By-Law on Control of Waste Vegetable Oils

By-Law on Recycling Participation Share

By-Law on Control of Excavation Soil and Construction and Demolition Waste

By-Law on the Rehabilitation of Degraded Land Due to Mining Activities

By-Law on Waste Management

By-Law on Control of End of Life Vehicles

By-Law on Control of End-of-life Tires

By-Law on Control of Polychlorinated Biphenyls and Polychlorinated Terphenyls

By-Law on Control of Hazardous Waste

By-Law on Control of Medical Waste

By-Law on Mining Wastes

By-Law on Zero Waste

MARINE AND COASTAL MANAGEMENT

By-Law on Reception of Wastes from Ships and Waste Control

By-Law on Bathing Water Quality

By-Law on Dredging and Environmental Management of Dredged Material

By-Law on Implementation of the Law Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances

By-Law on Purchasing Goods and Services Pursuant to the Law Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances

AIR MANAGEMENT

By-Law on Reduction of Sulfur Rate in Some Fuel Oil Types

By-Law on Large Combustion Plants

By-Law on Assessment and Management of Environmental Noise

By-Law on Exhaust Gas Emission Control and Gasoline and Diesel Quality

By-Law on Air Quality Assessment and Management

By-Law on Control of Air Pollution from Heating Sources

By-Law on Measures to be Taken for the Protection of the Environment and Public Health from the Adverse Effects of Non-Ionizing Radiation

By-Law on Control of Odor Emissions

By-Law on Control of Industrial Air Pollution

MANAGEMENT OF CHEMICALS

By-Law on Limitations Relating to Production, Placing on the Market and Usage of Certain Dangerous Substances, Preparations and Articles

By-Law on Inventory and Control of Chemicals

By-Law on test methods for the determination of the Physico-chemical properties, toxicity, and ecotoxicity of substances and preparations

By-Law on Classification, Labeling and Packaging of Substances and Mixtures

By-Law on Preparation and Distribution of Safety Data Sheets regarding Dangerous Substances and Preparations

By-Law on Safety Data Sheets Regarding Hazardous Substances and Mixtures By-Law on Restriction and Prohibition of Hazardous Substances and Mixtures

WATER AND SOIL MANAGEMENT

By-Law on the Procedures and Principles for Determining the Tariffs for Wastewater Infrastructure and Domestic Solid Waste Disposal Facilities

By-Law on the Procedures and Principles to be applied for Incentive Measures for Wastewater Treatment Plants pursuant to Article 29 of the Environmental Law

By-Law on Use of Domestic and Urban Treatment Sludges in Soil

By-Law on Urban Wastewater Treatment

By-Law on Control of the Purchase and Operation of Sand, Gravel and Similar Materials

By-Law on Water Pollution Control

By-Law on Control of Pollution Caused by Dangerous Substances in Aquatic Environment

By-Law on Soil Pollution Control and Point Source Contaminated Sites

By-Law on the Protection of Ground Waters against Pollution and Deterioration

By-Law amending the By-Law Surface Quality Management

By-Law on Control of Water Losses in Drinking Water Supply and Distribution Systems

By-Law on Monitoring Surface Waters and Groundwater

By-Law on Protection and Improvement of Waters Being Habitat for Trout and Crab Species

By-Law on the Quality of Surface Waters from Which Drinking Water is Obtained or Planned to be Obtained

By-Law on Protection of Basins and Preparation of Management Plan

By-Law on the Protection of Ground Waters against Pollution and Deterioration

By-Law on Surface Water Quality Management

CLIMATE CHANGE

By-Law on Reduction of Ozone-depleting Substances

By-Law on Fluorinated Greenhouse Gases

By-Law on Monitoring of Greenhouse Gas Emissions

CONSERVATION OF NATURAL HERITAGE

By-Law on Cargo Vehicles operating in Lake Köyceğiz and Dalyan Canals

By-Law on the Procedures and Principles Regarding Organization and Functions of the Commission for Protection of Cultural and Natural Properties

By-Law on the Plans to be Made in Protected Areas

By-Law on the Procedures and Principles Regarding Determination, Registration and Approval of Protected Areas

By-Law on the Administration of Places under the Authority of the State such as Natural Heritage Sites, Natural Protected Areas and, Special Protected Area

By-Law on Planned Areas Type Zoning

By-Law on the Replacement of Natural Property, Natural Protected Areas and Building Banned Immovables in Specially Protected Environment Area with Treasury Immovables

OTHERS

By-Law on Tracking and Collecting Environmental Incomes and Use of Allowances Provided in Return for Collection

By-Law on Determining Offenses, Imposing and Collecting Fines concerning Administrative Fines to be Imposed Pursuant to the Environmental Law.

By-Law on Regarding the Working Principles of Higher Board of Environment and Local Environment Committees

Ministry of Environment and Urbanization By-Law on Revolving Fund Management

H.2.3. Communiqués

WASTE MANAGEMENT

Communiqué on Interim Waste Storage Facilities

Communiqué on Waste Collection Centers

Communiqué on Transportation of Wastes by Road Transport

Communiqué on Recycling Some Non-Hazardous Wastes

Communiqué on Technical Procedures Regarding Storage, Decontamination, Disassembly and Processing of End-of-Life Vehicles

Communiqué on Tank Cleaning Facilities

Communiqué on Refuse-derived Fuel, Additional Fuel and Alternative Raw Material

Compost Communiqué

MARINE AND COASTAL MANAGEMENT

Communiqué on Administrative and Technical Regulation to be Applied for Waste Receiving Vessels

Communiqué on Fees and Principles to be Applied within the Framework of By-Law on Receiving Waste from Ships and Control of Wastes (2009/3)

Communiqué on the Determination of Enclosed Coves and Bay Areas that are Sensitive Areas where Fish Farms cannot be Established in the Seas

Communiqué on the Monitoring of Fish. Breeding Facilities Established in the Seas

Communiqué on Quality Standards Regarding Waters Accommodating Shellfish (2008/29)

Communiqué on the Shore Facilities Mandatory Financial Liability Insurance for Marine Pollution

CLIMATE CHANGE

Communiqué on Voluntary Carbon Market Project Registry

Communiqué on Verification of Greenhouse Gas Emission Reports and Authorization of Verifiers

Communiqué on Monitoring and Reporting of Greenhouse Gas Emissions

Communiqué on Certification of Real and Legal Persons that Intervene in Equipment that Contain Fluorinated Greenhouse Gas or whose Operation is Based on These Gases

WATER AND LAND MANAGEMENT

Communiqué on Technical Procedures regarding Wastewater Treatment Plants

Sensitive and Less-Sensitive Water Areas Communiqué concerning By-Law on Urban Wastewater Treatment

Communiqué on Administrative Procedures of By-Law on Water Pollution Control

Communiqué on Sampling and Analysis Methods related to the Implementing the By-Law on Water Pollution Control

Revision of the Communiqué on Dangerous and Hazardous Substances related to the Implementing the By-Law on Water Pollution Control

Communiqué of Integrated Pollution Prevention and Control in Textile Sector

Communiqué on the Protection of Stagnant Surface Inland Waters against Eutrophication

Communiqué on Technical. Procedures for the Control of Water Losses in Drinking Water Supply and Distribution Systems

The Communiqué on Basin Management Committees Establishment, Duties and Working Principles

Communiqué on Technical Personnel Working in Wastewater Treatment Plants

MEASUREMENT AND MONITORING

Communiqué on Continuous Wastewater Monitoring Systems

Continuous Emission Measurement Systems Communiqué

CHAIN OF ENVIRONMENTAL COMPLIANCE

Communiqué on Internal Emergency Plan to be Prepared for Major Industrial Accidents

Communiqué on Administrative Fines Pursuant to the Environment Law No. 2872 (No: 2015/1) (O.G. 28.12.2014 / 29219)

ENVIRONMENTAL QUALIFICATION

Communiqué on the Minimum Characteristics of Institutions and Organizations that will Prepare Risk Assessment and Emergency Response Plans for Pollution of the Marine Environment with Oil and Other Hazardous Substances

Communiqué on Verification of Greenhouse Gas Emission Reports and Authorization of Verifiers

Communiqué on Certificate of Qualification in the Control of Soil Pollution and Cleaning of Point Source Contaminated Sites

Communiqué on EIA Certificate of Competence

H.2.4. Circulars

WASTE MANAGEMENT AND WASTE TREATMENT

Circular on the By-Law on Landfilling of Waste (2010/16)

Circular on Preparation of Implementation Projects for Landfill Facilities (2014/13)

Inspection Instruction of Landfill Facilities (2011/13)

Circular on Integrated Waste Management Plan (2010/09)

Circular on Prevention of Wasting Stationery Equipment (2012/13)

Delegation of Authority regarding Excavation Soil and Construction and Demolition Waste (2008/6)

Control of Excavation Soil and Construction and Demolition Waste (2004/5)

Circular on Business Deadline Plans for Solid Waste Disposal Facilities (2006/14)

Circular on Approval of the Projects for Solid Waste Disposal and Prior Processing Facilities (2011/12)

Circular on Solid Wastes (2004/7)

Circular on Solid Wastes (2003/8)

Solid Waste Characterization and Solid Waste Disposal Facilities Information Update (2007/10)

Circular on Permits for Solid Waste Disposal and Landfill Facilities in Areas Considered Forest (2011/10)

Circular on Covid-19 Measures in the Management of Personal Hygiene Material Wastes such as Disposable Masks and Gloves (2020/12)

Circular on Medical Waste Year-End Reports (2006/25)

Circular on Disposal of Medical Wastes (2010/17)

Safe Disposal of Medical Wastes (2008/9)

Circular on Training Programs of By-Law on Medical Waste Control (2018/8)

Circular on Sterilization of Medical Wastes (2006/7)

Procedures and Principles regarding Packaging Wastes (Consent No. B.09.0.EMC.0.10.04-145.07-12444 dated 22.10.2012)

MARINE AND COASTAL MANAGEMENT

Circular on Marine Waste Application (2020/21)

Circular on Marine Pollution Inspectors to be Assigned for Control of Marine Pollution from Ships and the Training to be given to this Personnel (2010/8)

Circular on Delegation of Authority (Illegal Dumping) (2011/9)

Circular on Preparation and Implementation of Marine Litter Provincial Action Plans (2019/09)

Circular on Implementation and Authorization Transfer of Sea Bottom Screening and Discharge Activities

Circular on Deep-sea Discharge Monitoring

Wastewater Treatment/Deep-Sea Discharge Facility Project Approval Circular

Circular on Transfer of Authority (Fish Farms)

Circular regarding the Approval Procedure of Coastal Facility Risk Assessment and Emergency Response Plan (2009/6)

AIR MANAGEMENT

Circular on 2014 Exhaust Gas Emission Measurements (2014/09)

Circular on Control of Environmental Noise from Entertainment Places (2011/11)

Circular on Air Quality Assessment and Management (2013/37)

Circular on Air Pollution Control and Prevention (2010/14)

Circular on Imported Solid Fuels (2011/4)

Circular on Imported Solid Fuels (2015/02))

WATER AND LAND MANAGEMENT

Circular on Abrogation of the Circular No. 2004/12 on Solid Waste and Wastewater Management (2013/11)

Circular regarding the Approval Procedure of Wastewater Treatment/Deep-sea Discharge Facility (2018/14)

Restriction on Discharge Standards in Ergene River (2019/17)

Circular on Wastewater Treatment Facility Identity Certificate (2015/6)

Circular on Technical Procedures to be applied in Management of Wastewaters in Olive Oil Production Facilities (2015/10)

CLIMATE CHANGE

Circular on Climate Change and Air Management Coordination Board (2013/11)

Circular on Import and Use of Ozone Depleting Substances (2016/01)

Circular on Halon (2007/4)

ENVIRONMENTAL QUALIFICATION

Procedures and Principles for Determining the Qualifications of Vehicle Tracking Service Providers

CONSERVATION OF NATURAL HERITAGE

Circular on Activities of CNT Commission (2011/17)

Circular on Application of Equal Pay Processes (2011/21)

Circular on Procedures and Principles regarding the Development Plan Proposals for Protected Areas (2014/23)

H.3. Ratified / Acceded International Environmental Conventions, Agreements and Protocols

International environmental conventions, agreements, protocols ratified/ acceded by the Republic of Turkey are given below.

- The Antarctic Treaty
- The European Landscape Convention (Florence Convention)
- The Bern Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention)
- The Convention for the Protection of the Mediterranean Sea Against Pollution (Barcelona Convention)
- The International Convention for the By-Law of Whaling (Whaling Convention)
- The United Nations Convention on Biological Diversity
- United Nations Framework Convention on Climate Change (UNFCCC)
- Kyoto Protocol
- The Intergovernmental Panel on Climate Change (IPCC)
- The Convention on the Prevention of Marine Pollution from land-based sources (Paris Convention)
- The International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)
- The Convention concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention)
- The Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention)
- Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention)
- Vienna Convention for the Protection of the Ozone Layer
- The United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD)

- The Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR)
- The International Convention on Civil Liability for Oil Pollution Damage (Civil Liability Convention-CLC 92)
- The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND 1992)
- The Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal (Basel Convention)
- The Convention on Long-rangeTransboundary Air Pollution
- The Co-operative Programme for Monitoring and evaluation of the Long-rangeTransmission of Air Pollutants in Europe (EMEP)
- The United Nations Economic Commission for Europe Convention on Long-rangeTransboundary Air Pollution (CLRTAP)
- The Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention)
- The Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (İzmir)
- The Montreal Protocol on Substances that Deplete the Ozone Layer
- The Protocol concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency
- The Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft
- The Protocol on the Protection of the Black Sea Marine Environment Against Pollution from Land-Based Sources (LBS)
- The Black Sea Biodiversity and Landscape Conservation Protocol
- The Protocol on The Protection of the Black Sea Marine Environment Against Pollution by Dumping
- The Protocol on Cooperation in Combating Pollution of the Black Sea Marine Environment by Oil and other Harmful Substances in Emergency Situations
- The Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources
- The Convention on the Transboundary Effects of Industrial Accidents is a United Nations Economic Commission for Europe (ECE)
- Agreement between the European Community and the Republic of Turkey concerning the participation of the Republic of Turkey in the European Environment Agency and the European environment information and observation network
- Mediterranean Action Plan

H.4. Environmental Impact Assessment and Strategic Environmental Assessment Activities

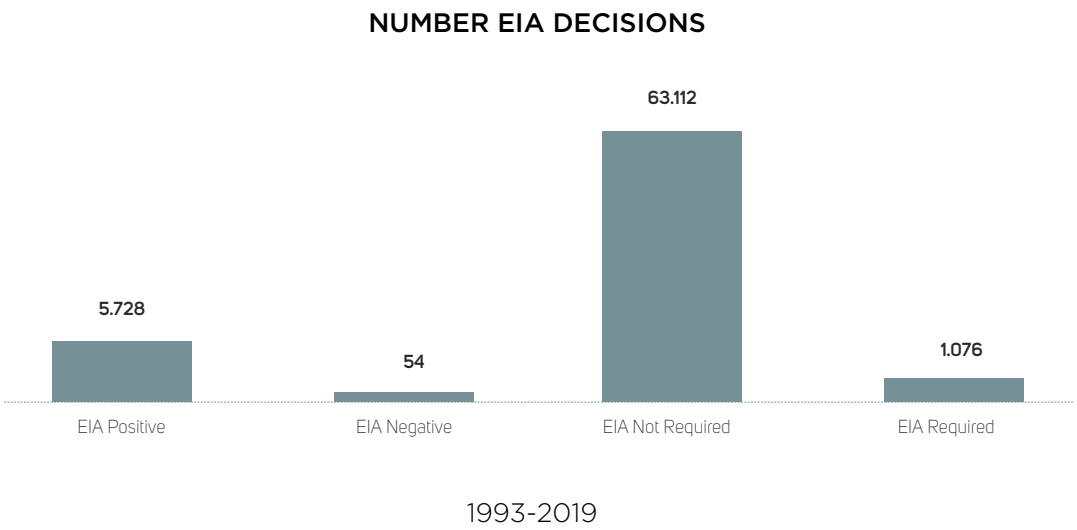
H.4.1. Environmental Impact Assessment Activities

The concept of Environmental Impact Assessment entered our country with Article 10 of the Environmental Law, which started to be implemented in 1983. Environmental Impact Assessment is regarded as one of the most important means of sustainable development and accepted as the first stage of the environmental compliance chain and has been implemented in our country since 1993 with the publication of the "By-Law on Environmental Impact Assessment (EIA)" in the Official Gazette No. 21489 dated 7 February 1993. The By-Law has been updated at different times due to both the elimination of the difficulties encountered in practice and the EU harmonization process. The latest By-Law on Environmental Impact Assessment (EIA) in force was published in the Official Gazette No. 29186 dated 25.11.2014.

Table 99 – The Number of EIA Decisions Made by the Ministry of Environment and Urbanization between 2016 - 2019
(Ministry of Environment and Urbanization, 2020)

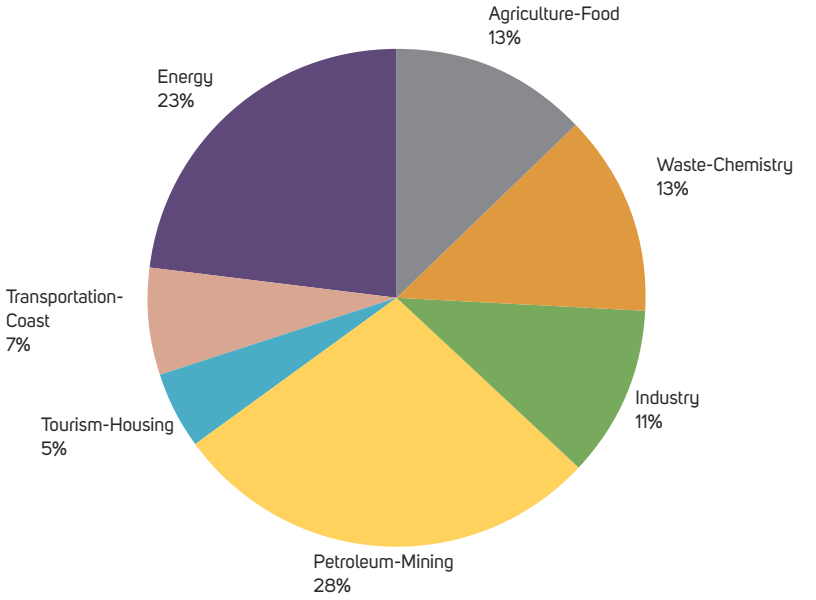
YEAR	EIA POSITIVE	EIA NOT REQUIRED	EIA REQUIRED
2016	405	3,157	95
2017	431	3,301	57
2018	401	3,036	76
2019	440	2,418	71

Graph 49 – Distribution of EIA decisions made between 1993 and 2019 within the scope of the By-Law on Environmental Impact Assessment
(Ministry of Environment and Urbanization, 2020)

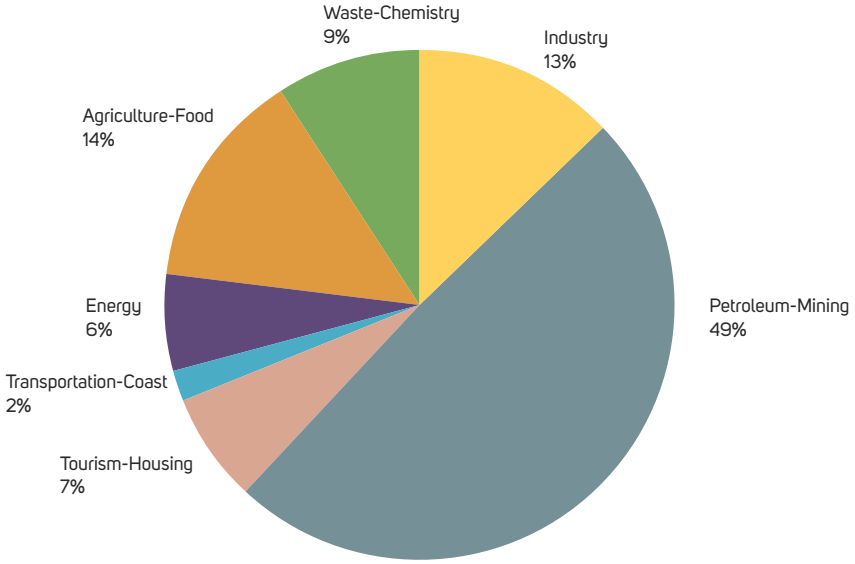


Decisions of "EIA Positive" or "EIA Negative" about the projects within the scope of Annex List-1 of By-Law on Environmental Impact Assessment (EIA) are taken by the Ministry, and decisions of "EIA required" or "EIA Not Required" about the projects within the scope of Annex List-2 are taken by Provincial Directorates of Environment and Urbanization.

Graph 50 – Sectoral Distribution of Positive EIA Decisions (1993-2019) (Ministry of Environment and Urbanization, 2020)



Graph 51 – Sectoral Distribution of EIA Not Required Decisions (1993-2019) (Ministry of Environment and Urbanization, 2020)



H.4.2. Strategic Environmental Assessment Activities

By-Law on Strategic Environmental Assessment (SEA) was started to be implemented after being published in the Official Gazette No. 30032 on 8 April 2017. The plans/programs of which the screening process has been completed within the scope of the By-Law on SEA and the plans of which the SEA process are in progress are given below.

Plans/Programs of which 2019-2020 SEA Screening Processes have been Completed (Screening Decision);

- The Support Program for Rural Development Investments within the Scope of Rural Development Supports (Not Subject to the SEA)
- Nitrates Action Programme (Subject to the SEA)
- Action Plan for Determining Potential Aquaculture Areas of Adana Province, Yumurtalık District Coastal Areas (Subject to the SEA)
- Preparation of Master Plan for Drinking Water and Sewerage of İstanbul (Subject to the SEA)
- Preparation of Master Plan for Drinking Water, Wastewater and Stormwater Management of Ankara (Subject to the SEA)

The plans of which 2019-2020 SEA Processes are ongoing;

- Gediz River Basin Management Plan
- Çoruh Basin Flood Management Plan
- Eastern Black Sea Basin Flood Management Plan
- Asi Basin Flood Management Plan
- Seyhan Basin Flood Management Plan
- Lake Van Basin Flood Management Plan
- Konya Closed Basin Flood Management Plan
- North Aegean River Basin Management Plan
- Küçük Menderes River Basin Management Plan
- Burdur River Basin Management Plan
- Akarçay River Basin Management Plan
- Yeşilırmak River Basin Management Plan
- Western Mediterranean River Basin Management Plan
- Kırklareli-Tekirdağ-Edirne Integrated Coastal Areas Management Plan (Pilot Sector)
- North Aegean Basin Nitrate Action Plan (Pilot Sector)

H.5. Environmental Permit and License Activities

According to Environment Law No. 2872, all enterprises with negative environmental effects that deal with the works and processes related to the recovery, recycling and disposal of permitted wastes must obtain licenses to operate. A single environmental permission application based on the integrated approach strategy, instead of the discharge permit, emission permit, noise permit, deep-sea discharge permit and licenses on waste management, required by the activities and facilities that previously had a polluting effect on the environment in our country within the scope of the relevant by-laws, has been implemented as of 01 April 2010. Accordingly, the By-Law on the Permits and Licenses Required by the Environment Act, which was prepared based on the Environment Law and published in the Official Gazette No. 27214 dated 29 April 2009 entered into force on 01 April 2010, was repealed. Then the By-Law on Environmental Permit and License, which was published in Official Gazette No. 29115 dated 10.09.2014, entered into force on 01 November 2014.

The enterprises listed in Annex-1 and Annex-2 of the By-Law are required to obtain an environmental permit or an environmental permit and license to operate. Issuance of Environmental Permit/License Certificate is carried out at two process stages. In the first stage, a Provisional Activity Certificate (PAC), which means a preliminary permit and valid for 1 year, is issued to the enterprises of which information and documents are approved within the scope of Annex-3A and Annex-B of the By-Law. In the second stage, the environmental permit/license process is completed and turns into a 5-year final permit. Within the scope of the By-Law, there are 4 permit subjects and 26 license subjects under the main titles of Recycling, Disposal, Interim Storage, Treatment, and Purification.

The Central Organization of the Ministry and Provincial Directorates of Environment and Urbanization have given PACs to 27,575 activities or facilities in total, and given Environmental Permit or Environmental Permit and License Certificates to 29,984 activities or facilities since 2010, when the By-Law on the Permits and Licenses Required by the Environment Act and then the By-Law on Environmental Permit and License, began to be implemented. Data for the PACs and Environmental Permit / Environmental Permit and Licenses for the years 2015-2019 are given in Table 100.

Table 100 – The Number of Documents Submitted within the Scope of the By-Law on Environmental Permit and License by Years
(Ministry of Environment and Urbanization, 2020)

ENVIRONMENTAL PERMIT AND LICENSES	2015	2016	2017	2018	2019	TOPLAM
PROVISIONAL ACTIVITY CERTIFICATE	3,615	2,269	2,932	2,433	3,023	14,272
ENVIRONMENTAL PERMIT AND LICENSE	3,719	2,742	4,407	4,216	4,867	19,951

Provisional Activity Certificate (PAC) and Environmental Permit/License processes are carried out through the Environmental Permit and License Application (e-permit), which is one of the Integrated Environmental Information System (IEIS) applications.

In this application, enterprises can make a single permit application for all permit license issues to which they are subject by using an electronic signature, 24/7 from any point with an internet connection, and follow the application process online. The applications are examined electronically by the competent authority, the process is concluded without using any wet-signature at any stage of the process, and this information is transferred to the electronic environment via **https://eizin.cevre.gov.tr** simultaneously with the issuance of PAC or permission and license certificate to the enterprises.

H.5.1. Environmental Import and Export Permit Activities

The Ministry of Environment and Urbanization carries out the processes and procedures regarding the import of certain fuels, substances, wastes, hazardous chemicals and properties containing such chemicals under the Environment Law No.2872, within the scope of the Communiqués published by the Ministry of Trade. The Ministry of Environment and Urbanization issues the Metal Scrap Importer Certificate for the import of metal scrap, the Waste Importer Registration Certificate for the import of waste, and the Solid Fuel Importer Registration Certificate for the import of solid fuel. At the same time, the Ministry monitors the use of petroleum coke by preparing the permits for use of petroleum coke and ensuring the allocation of the petroleum coke. Furthermore, the export of hazardous waste and non-hazardous waste is carried out with the permission of the Ministry within the scope of By-Law on the Waste Management and the Basel Convention to which Turkey is a party. Moreover, the batteries and accumulators are imported in accordance with the By-Law on the Control of Waste Batteries and Accumulators with the prior authorization for importing batteries and accumulators.

"Metal Scrap Importer Certificate", "Solid Fuel Importer Registration Certificate", "Waste Importer Registration Certificate", "Solid Fuel Import Exemption Permit", "Hazardous Waste Export Permit" and "Non-Hazardous Waste Export Permit" issued by the Central Organization of the Ministry of Environment and Urbanization and "Waste Import Conformity Certificate", "Waste Import Out of Scope Certificate" and "Solid Fuel Import Compliance Certificate" issued by our Provincial Directorates of Environment and Urbanization actualize through "Environmental Import and Export Permits Application" which was integrated with the Single Window System of the Ministry of Commerce and commissioned on 01.11.2018.

Waste Importer Registration Certificate and quota form have started to be issued within the scope of the Ministry of Environment and Urbanization Waste Import Implementation Circular No. 2019/18 since 2020.

The number of import and export documents been issued within the Ministry of Environment and Urbanization since 2015 is included in Table 101 below.

Table 101 – The number of Import and Export Documents Issued by the Ministry of Environment and Urbanization

(Ministry of Environment and Urbanization, 2020)

Communiqué-By-Law-Contract Name	Name of the Issued Document	Number of the Documents for 2015	Number of the Documents for 2016	Number of the Documents for 2017	Number of the Documents for 2018	Number of the Documents for 2019
Communiqué on Import Inspection of Metal Scraps that are under control relating to the protection	Metal Scrap Importer Certificate	24	45	32	73	58
Basel Convention and By-Law on the Control of End of Life Tires	Transit Pass Permit	6	2	-	-	-
Communiqué on Import Controls of Batteries and Accumulators published under the By-law on Control of Used Batteries and Accumulators	Approval of Prior Authorization for Import	1294	1239	1419	1092	1189
Communiqué on Import Inspection of Solid Fuels that are under control relating to protection of environment	Solid Fuel Importer Registration Certificate	118	117	115	113	113

Communiqué-By-Law-Contract Name	Name of the Issued Document	Number of the Documents for 2015	Number of the Documents for 2016	Number of the Documents for 2017	Number of the Documents for 2018	Number of the Documents for 2019
Communiqué on Import Inspection of Solid Fuels that are under control relating to protection of environment	License to use petroleum coke	11	9	36	44	32
Communiqué on Import Inspection of Solid Fuels that are under control relating to protection of environment	Solid Fuel Importer Exemption Permit		9	3	10	12
Imported Solid Fuels Circulars No. 2011/4, 2015/2	High Sulfur Petroleum Coke Allocation		18	25	47	40
Imported Solid Fuels Circulars No. 2011/4, 2015/2	High Sulfur Hard Coal Allocation		1	2	8	7
Imported Solid Fuels Circulars No. 2015/2	High Volatile Hard Coal Allocation	-	6	3	8	6
Letter No. 40160356-125.01-E.7551 dated 09/06/2016 an	National Petroleum Coke Compliance Certificate	-	22	7	21	25
By-Law On Waste Management and Basel Convention	Hazardous Waste Export Permit	28	242	4	4	4
	Non-Hazardous Waste Export Permit			552	869	1.220

H.6. Environmental Inspections Activities

H.6.1. Number of Environmental Inspections

General Directorate of Environmental Impact Assessment, Permit and Inspection and 81 Provincial Directorates of Environment and Urbanization implement the By-Law on Environmental Inspection due to the current structure of the Ministry of Environment and Urbanization.

The e-inspection software, which enables the entire environmental inspection process to be carried out in a digital and web-supported environment, was completed in 2014 and started to be used by 81 Provincial Directorates of Environment and Urbanization in 2015. In the e-inspection system, it is possible to carry out environmental inspections under the guidance of checklists, prepare and record the minutes, inspection reports, and administrative investment decision minutes, follow up administrative sanctions, and, if any, the relevant lawsuit processes through the system.

Table 102 – Distribution of the number of environmental inspections carried out by the Ministry of Environment and Urbanization by year

(Ministry of Environment and Urbanization, 2020)

	2016	2017	2018	2019
Ministry Center	353	275	217	378
Provincial Directorates of Environment and Urbanization	52,256	51,766	50,239	53,785
TOTAL	52,609	52,041	50,426	54,163

Table 103 – Institutions and Subject Headings Entrusted on Inspection and Delegating Enforcement by the Ministry of Environment and Urbanization

(Ministry of Environment and Urbanization, 2020)

RELATED BY-LAW	CIRCULAR NUMBER	ENTRUSTED INSTITUTIONS	NUMBER
By-Law on Control of Waste Vegetable Oils	2872-12 art.	12 Metropolitan Municipalities 84 Mayorships	96
Excavation Soil, Construction and Demolition Waste	2008/6	Metropolitan Municipalities of Istanbul, Kocaeli, Sakarya, Gaziantep, Bursa, Ordu, Ankara, Trabzon, Antalya	9
By-Law on air pollution caused by heating	2006/19	17 Metropolitan Municipalities 146 Mayorships	163
By-Law on assessment and management of environmental noise	2006/16	20 Metropolitan Municipalities 88 Mayorships Coast Guard Command Traffic Control Teams	110
Fish Farmings to be Established in the Seas	2010/11	Coast Guard Command	1
Marine Pollution from Ships	2011/9	Coast Guard Command Abrogated Undersecretariat of Maritime Affairs (Ministry of Transport and Infrastructure) Metropolitan Municipalities of Istanbul, Kocaeli, Mersin, Antalya	6

H.6.2. Imposed Administrative Enforcements

The administrative enforcements imposed by the Ministry of Environment and Urbanization in case of failure to fulfill the obligations stipulated in the Environment Law No. 2872 and the relevant by-laws are given in the tables below.

Table 104 – Total Amounts of Administrative Enforcements Imposed by the Ministry of Environment and Urbanization in accordance with the Environmental Law (TL)
(Ministry of Environment and Urbanization, 2020)

YEARS	Ministry Center	Provincial Directorates of Environment and Urbanization	TOTAL
2016	1,067,277	107,356,248	108,423,525
2017	6,600,421	158,497,768	165,098,189
2018	2,039,416	106,992,878	109,032,294
2019	9,230,406	138,804,417	148,034,823

Table 105 – Distribution of the Decisions of the Ministry of Environment and Urbanization to Suspend Activity in accordance with the Environmental Law by Year
(Ministry of Environment and Urbanization, 2020)

YEARS	Ministry Center	Provincial Directorates of Environment and Urbanization	TOTAL
2016	40	326	366
2017	28	296	324
2018	16	243	259
2019	15	274	289

H.6.3. Market Surveillance and Inspection Activities

The "Law No.4703 on Preparation and Implementation of the Technical Legislations on the Products" constitutes the legal basis for the establishment of a system in parallel to the market surveillance and control system of the European Union in our country and the "By-Law on Market Surveillance and Inspection of Products" prepared pursuant to the mentioned Law have been in force since 11 January 2002. While Law No. 4703 obliges the producers to only deliver safe products to the market, it also gives public institutions the authority to regulate and implement product-specific legislation.

Solid fuel inspections, which are under the responsibility of the Ministry of Environment and Urbanization and the institutions /organizations to which the related authority has been transferred, are carried out within the scope of the Environment Law No. 2872 and the secondary legislation published based on this Law.

Data regarding the market surveillance and inspection activities of solid fuels carried out by the Provincial Directorates of Environment and Urbanization and the institutions/organizations which have been entrusted with authority are presented in Table 106.

Table 106– Distribution of Market Surveillance and Inspection Activities by years
(Ministry of Environment and Urbanization, 2020)

	2016	2017	2018	2019
Number of MSI (item)	16,375	12,795	19,233	13,967
Imposed Fine Amount (TL)	465,302	244,967	134,788	309,776

H.6.4. Activities for Reducing Major Industrial Accident Risks

The "By-Law on the Prevention of Major Industrial Accidents and the Mitigation of Their Impacts", which harmonizes the "EU Council Directive on the Control of Major Accident Hazards Involving Dangerous Substances / Seveso-II-Directive" with the Turkish legislation, and is applied in the EU regarding the control of major industrial accidents, was put into effect after being published in the Official Gazette No. 30702 dated 2 March 2019.

The By-Law is implemented jointly by the Ministry of Environment and Urbanization, the Ministry of Family, Labor and Social Services (MoFLSS) and the Ministry of Internal Affairs/Disaster and Emergency Management Presidency. It determines the procedures and principles regarding the measures to be taken for ensuring high level, effective and continuous protection to prevent major industrial accidents in organizations containing hazardous materials to minimize the damages of possible accidents to people and the environment.

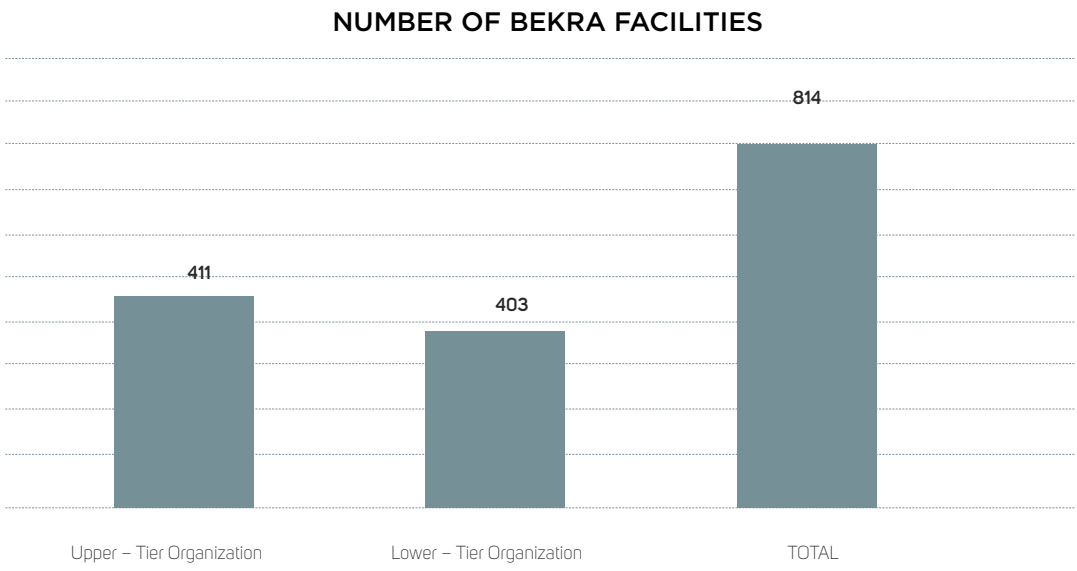
The relevant European Union standards, changes and regulations in the EU are constantly followed the "Communiqué on Safety Report to be Prepared for Major Industrial Accidents" and "Major Accident Prevention Policy Document" entered into force after being published in the Official Gazette No. 30750 dated 19 April 2019 and "Communiqué on Major Accident Scenario Document to be Prepared for Major Industrial Accidents" entered into force after being published in the Official Gazette No. 31171 dated 30.06.2020 in accordance with the updated By-Law and within the scope of its responsibility areas.

Regarding the Internal Emergency Plans which are under the responsibility of the Ministry of Environment and Urbanization, the "Communiqué on Internal Emergency Plans to be Applied in Major Industrial Accidents" was entered into force after being published in the Official Gazette No. 31214 dated 15 August 2020.

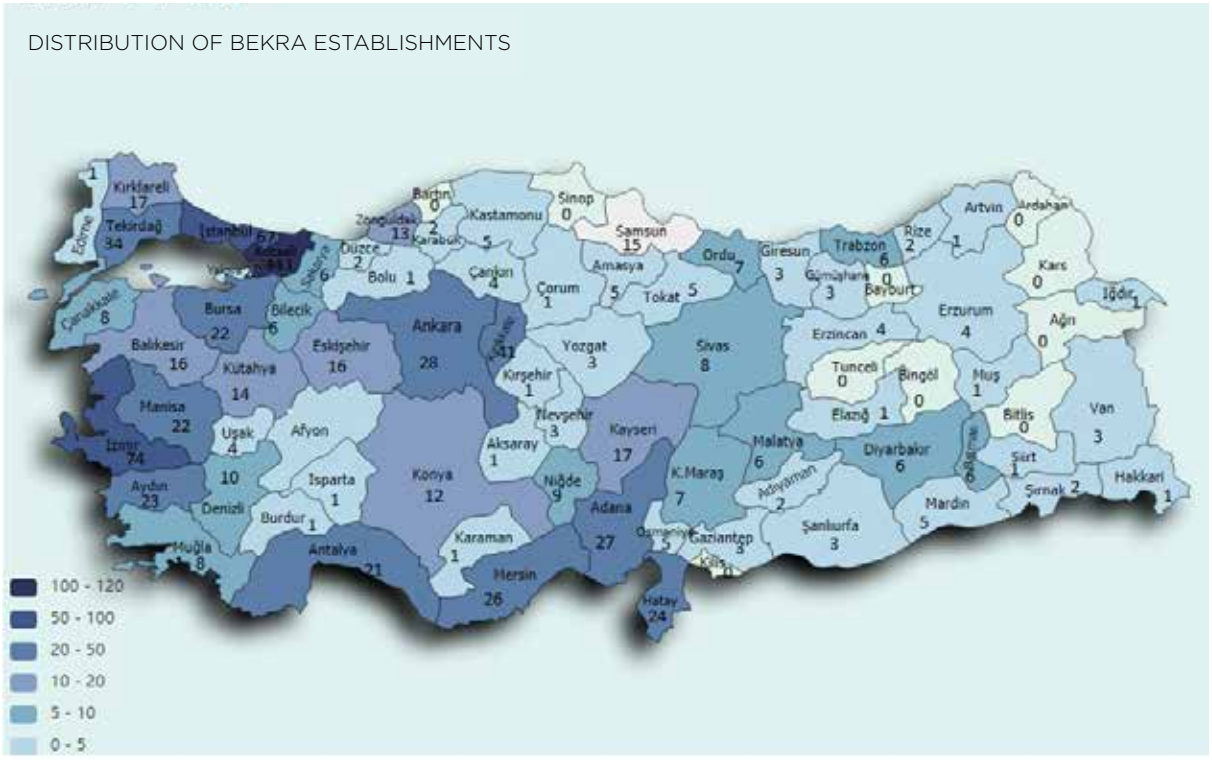
Facilities containing hazardous materials are primarily obliged to notify through the Seveso (BEKRA) Notification System that was established under the Integrated Environmental Information System of the Ministry of Environment and Urbanization. As a result of these notifications, 303 organizations and their inventories are kept as Upper-Tier and Lower-Tier.

According to the BEKRA Notification System; 814 BEKRA organizations, 411 of them Upper-Tier and 403 of them Lower-Tier (Graph 52), have notified as of July 2020.

Graph 52 – BEKRA Notification System Data as of July 2020
(Ministry of Environment and Urbanization, 2020)

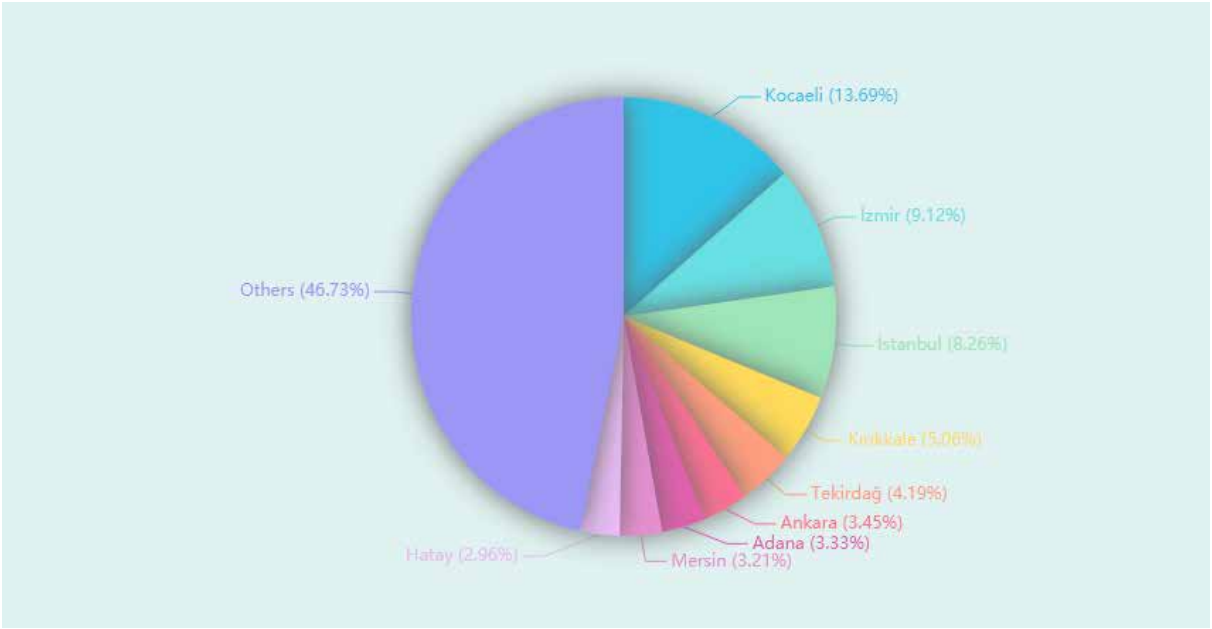


Map 30 – Geographical Distribution of BEKRA Establishments in Turkey as of July 2020 (Ministry of Environment and Urbanization, 2020)



Graph 53 – The Provinces Where BEKRA Establishments Are Most Centered in Turkey as of July 2020

(Ministry of Environment and Urbanization, 2020)



H.7. Environmental Qualification Activities

H.7.1. EIA Qualification Activities

Within the scope of the EIA Qualification Certificate Communiqué, the Ministry of Environment and Urbanization examines the EIA Qualification Certificate requests made by the institutions /organizations for the preparation of the EIA Report, EIA Application File, Project Introduction File and carries out the certification procedures of those that comply with the legislation. Moreover, monitoring and auditing of the organizations with the certificates are carried out within the scope of the Communiqué.

Table 107 – Distribution of the Number of Firms with EIA Qualification by Years (Ministry of Environment and Urbanization, 2020)

Years	Number of the Firms with Certification	Number of Inspected Firms
2004-2015	285	643
2016	15	46
2017	16	30
2018	12	40
2019	16	179
2020 (September)	8	-
TOTAL	352	938

H.7.2. Qualifications of Environmental Officers, Environmental Consulting Firms and Environmental Management Units

The concepts of "Environmental Officer", "Environmental Consultancy Firms" and "Environmental Management Units" have been formed to enable the plants and facilities to carry out a more effective process for the prevention of environmental pollution of the facility or activities and to increase professionalism and efficiency in compliance with the legislation. It has been aimed that environmental officials contribute to the protection of the environment by ensuring that institutions, organizations and enterprises that will cause environmental pollution or harm the environment as a result of their activities take the necessary precautions without causing environmental pollution.

The legal framework of the issue has been established by the amendment to the Environmental Law No. 2872 made by Law No.5491 in 2006 and thereby the 2nd Additional Article of the Law requires the institutions, organizations and facilities which, as a consequence of their activities, may cause environmental pollution or harm the environment to establish environmental management units, employ environmental representatives or procure service from the institutions or corporations authorized by the Ministry.

The related procedures and principles were first determined by the By-Law on Environmental Inspection, which entered into force on 01 January 2009 following its publication in the Official Gazette No. 27061 dated 21.11.2008. They were regulated more comprehensively with the "By-Law on Environmental Officer, Environmental Management Unit and Environmental Consultancy Firms" published in the Official Gazette No. 28828 dated 21/11/2013 (Amended: 06/05 / 2014-28992).

However, the expression of "officer" in the definition of "environmental management unit/environmental officer" in the first paragraph of the 2nd article of the Environment Law No. 2872 dated 09/08/1983 was changed to "environmental engineers, existing environmental officers and the officer whose principles and procedures are determined by the relevant by-law" with the provision in the twelfth paragraph of the 28th article of the Law on the Amendment of the Environmental Law and the Law No. 7153 dated 29/11/2018.

The By-Law No. 28828 on Environmental Officer, Environmental Management Unit and Environmental Consultancy Firms dated 21/11/2013 was repealed (Amendment: 06.05.2014-28992) and "By-Law on Environmental Management Services" entered into force after being published in the Official Gazette No. 30847dated 30/7/2019 to reflect the amendment made in the article of the Law to the By-Law and to make the implementation better. The definitions of "Environmental Officer" and "Environmental Engineer" were made individually in the aforementioned By-Law.

Within the scope of the aforementioned By-Law, the works activities and processes revalant to the certification of environmental officers/environmental engineers, environmental management unit and environmental consultancy companies are conducted electronically by the Ministry of Environment and Urbanization through the "e-competence" system, a sub-application of the "Integrated Environmental Information System. The numbers of the active Environmental Officer / Environmental Engineer, Environmental Management Unit and Environmental Consultancy Firms that have been certified as of 2020 are given in Table 108.

Table 108 – The numbers of the certified active Environmental Officer / Environmental Engineer, Environmental Management Unit and Environmental Consultancy Firms as of 2020 (Ministry of Environment and Urbanization, 2020)

Number of active documents	2020
The Environmental Officer / Environmental Engineer granted with the "Environmental Management Service Qualification Certificate"	11,964
The Environmental consultancy firm granted with the "Environmental Consultancy Firm Qualification Certificate"	652
The environmental management unit granted with the "Environmental Management Unit Qualification Certificate"	301

On the other hand, the Ministry of Environment and Urbanization and Provincial Directorates of Environment and Urbanization inspect the environmental consultancy companies with qualification certificates within the scope of Article 9 of the By-Law on Environmental Management Service.

Table 109 – The number of the Environmental Consultancy Inspections conducted by the Ministry of Environment and Urbanization and Provincial Directorates of Environment and Urbanization between 2012-2019 (Ministry of Environment and Urbanization, 2020)

Number	2012	2013	2014	2015	2016	2017	2018	2019
Number of environmental consultancy company inspections	94	111	229	199	153	189	179	322

H.7.3. Laboratories Authorized to Make Environmental Measurements

The private and public laboratories working within the scope of Environmental Legislation that meet the conditions determined by the Ministry of Environment and Urbanization have been granted with "Environmental Measurement and Analysis Qualification Certificate" since 2004. The By-Law on the Environmental Measurement and Analysis Laboratories Qualification, entered into force after being published in the Official Gazette No. 26988 dated 05.09.2008, was revised after being published in the Official Gazette No. 28862 dated 25 December 2013 in line with the needs encountered in practice. Laboratories conducting measurement and analysis activities within the framework of the Environmental Legislation are authorized by the Ministry of Environment and Urbanization in accordance with the By-Law on the Environmental Measurement and Analysis Laboratories Qualification.

The number of the laboratories authorized to make measurement/analysis by the Environment Reference Laboratory of the Ministry of Environment and Urbanization within the scope of the Environmental Legislation between 2016-2020 is given in Table 110.

Table 110 – Change by Years of the Laboratories Authorized to Make Measurement / Analysis within the Scope of Environmental Legislation
(Ministry of Environment and Urbanization, 2020)

THE NUMBER OF AUTHORIZED LABORATORIES			
YEARS	PUBLIC	PRIVATE	TOTAL
2016	42	129	171
2017	45	135	180
2018	46	156	202
2019	50	165	215
2020 (September)	40	185	225

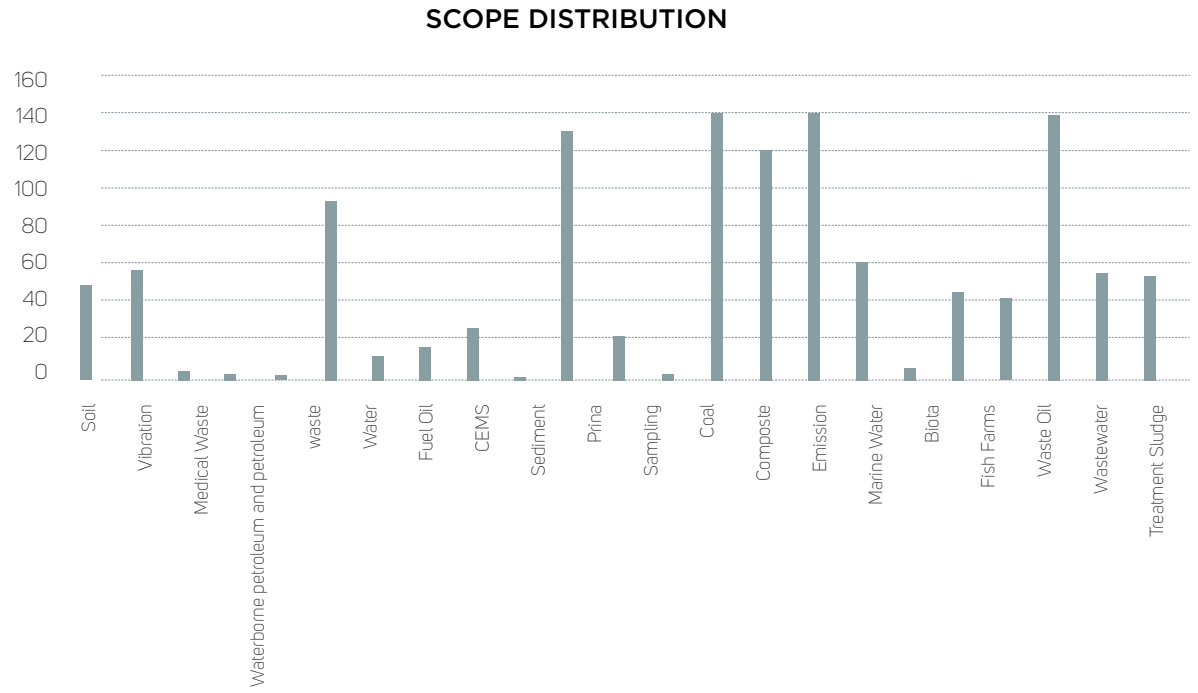
All authorization processes are carried out via a digital environment using the "Laboratory Authorization Application" software. Laboratories send documents and information to the Ministry of Environment and Urbanization on the official website of the Ministry and provide access to this information.

The number of the laboratories authorized by the Ministry of Environment and Urbanization within the scope of the By-Law on the Environmental Measurement and Analysis Laboratories Qualification was 225 as of September 2020.

A total of 66 applications, 7 first Qualification Applications, 32 Document Renewal Applications, 27 Scope Widening/Narrowing Applications, were evaluated as of September 2020. 32 laboratories operating in different scopes within the framework of Environmental Legislation were examined and inspected on-site as of September 2020.

Map 31 – Distribution of Environmental Measurement and Analysis Laboratories
(Ministry of Environment and Urbanization, 2020)

Graph 54 – Distribution of Laboratories Authorized to Make Measurement/Analysis within the Framework of Environmental Legislation by Scope as of September 2020 (Ministry of Environment and Urbanization, 2020)



H.7.3.1. Environmental Reference Laboratory

Environmental Reference Laboratory is a public laboratory operating under the Department of Laboratory, Measurement and Monitoring of the Ministry of Environment and Urbanization and it is established to carry out plans and projects for the protection, improvement and cleaning of the environment, and to conduct and have conducted the environmental research, examination and laboratory activities (Picture 8).

Picture 8 – Environmental Reference Laboratory

Measurements and analyzes, which are the basis for all kinds of permits, monitoring and inspections regarding environmental pollution, are carried out, private or public institutions and organizations laboratories are authorized, air and water quality monitoring activities are carried out.

All activities are conducted in the Environmental Reference Laboratory within the scope of the followings,

- TS EN ISO / IEC 17025: General Requirements for the Qualification of Test and Calibration Laboratory
- TS EN ISO 14001: Environmental Management System
- ISO 9001: Quality Management System.

More than 1,100 parameters, 580 of which are accredited, in the water, wastewater, seawater, soil, waste, sewage sludge, waste oil, isolation liquid, sediment, flue gas, coal, pomace and fuel oil samples are analyzed.

The decision-making process regarding the disposal of all kinds of waste is shortened and the source of the waste can be determined precisely by identifying the contents of the wastes faster without the need for toxicity and ecotoxicity tests in the R&D Laboratory (Photograph 9) established to ensure more effective implementation of the Waste Legislation by eliminating the gap in the environmental laboratory analyzing the hazardous wastes.

Picture 9 – R&D Laboratory

Private and public environmental laboratories are trained by expert technical personnel (Photograph 10) on sampling from,

- Water and Wastewater,
- Soil, Treatment Sludge and Solid Waste,
- Waste Oils and Isolation Liquids,
- Medical Waste,
- Solid Fuels,

and an exam is held at the end of the training. Successful participants are certified. The number of certified personnel has been approximately 3,000 in the pieces of the training organized since 2010.

Picture 10 – Sampling Training

H.7.4. Waste Tracking Systems

The procedures and principles regarding the determination of the qualifications of the Waste Tracking Systems (WTS) have been determined within the scope of the Communiqué on Transportation of Wastes by Road Transport, which entered into force after being published in the Official Gazette No. 29301 dated 20.03.2015. It has been revised and updated with Ministerial Consent No. 157295 dated 24/07/2020. These procedures and principles aim to control the transportation of the wastes, specified in the relevant legislation, from the waste producer to the disposal facility. it prevents the casual spilling of the wastes by controlling the transportation of the wastes taken by licensed companies from the waste producer to the waste disposal facility without any loss. 5 (five) companies have been granted with qualification certificates within the scope of the procedures and principles regarding the determination of the qualifications of the Waste Tracking Systems.

H.7.5. Cleaning up Polluted Soil

"The By-Law on Soil Pollution Control and Point Source Contaminated Sites" entered into force after being published in the Official Gazette No. 27605 dated 08.06.2010. "Communiqué on the Certificate of Qualification Regarding the Control of Soil Pollution and Cleaning of Point Source Contaminated Sites" entered into force after being published in the Official Gazette No. 27967 dated 17.06.2011 pursuant to Article 34 of the aforementioned By-Law. The communiqué covers issues regarding the conditions

to be met by the institutions/organizations, their operating procedures and principles, evaluation and inspection of the applications. However, the obligation of the certified companies under the communiqué started on 08.06.2015. A total of 21 institutions/organizations operate within the scope of this document.

H.7.6. Risk Assessment for Prevention of Pollution of the Marine Environment

"Communiqué on Authorization of Institutions and Organizations to Prepare Risk Assessment and Emergency Response Plans for Pollution of Marine Environment by Oil and Other Hazardous Substances" entered into force being published in the Official Gazette No. 29203 dated 12.02.2014. The communiqué was prepared pursuant to "The By-Law on Regarding the Implementation of the Law on Principles of Emergency Response and Compensation for Damages in the Pollution of Marine Environment with Oil and Hazardous Harmful Substances" published in the Official Gazette No. 26326 dated 21.10.2006. The communiqué covers issues regarding the conditions to be met by the institutions/organizations that will prepare a risk assessment and emergency response plans, their operating procedures and principles, evaluation and inspection of the applications. The applications of the institutions /organizations applying for a certificate are evaluated and concluded by the Ministry of Environment and Urbanization. Within this framework, the applications of 8 (eight) institutions/organizations were finalized within the scope of the Communiqué and they were granted with "Certificates of Qualification" as of July 2020.

H.7.7. Environmental Labeling

The National Environmental Label System in Turkey has been put into practice under the "By-Law on Environmental Labeling" published in the Official Gazette No. 30570 dated 19.10.2018 in accordance with the EU Directive 66/2010/EC on Eco-Label. The system aims to evaluate the environmental performance of products or services, produced and distributed, exported or put on the market through import, in accordance with international standards and to create environmental awareness in the field of sustainability. TS EN ISO 14024 Type I Environmental Labeling, Principles and Methods standard has been taken into account in the environmental labeling system in our country within the scope of the By-Law on Environmental Labeling.

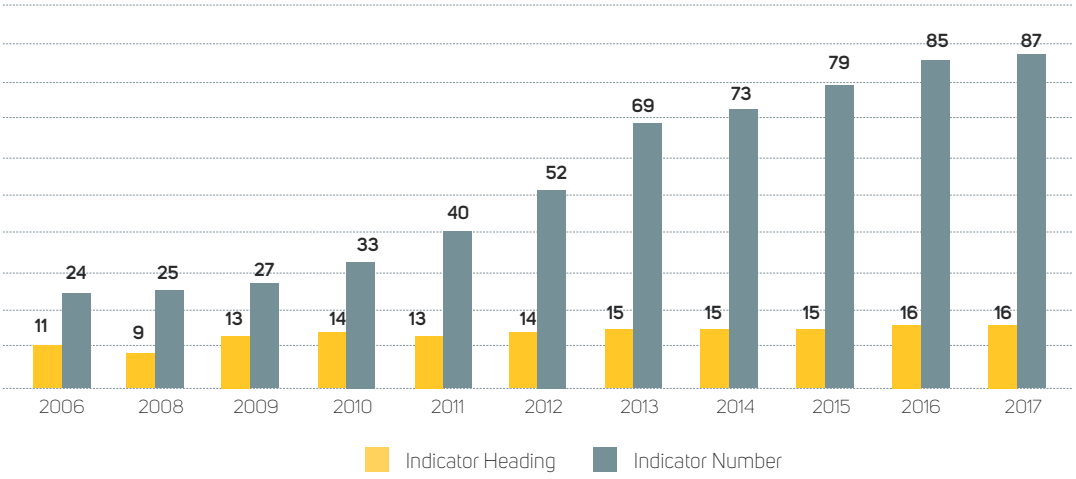
The applications have been accepted in three product groups: textile, cleaning paper and ceramic coating as of 2020. The criteria for the aforementioned product groups were published on 13.05.2019.

H.8. Environmental Inventory Studies

H.8.1. Environmental Indicators

The Environmental Indicators booklet is prepared in Turkish and English every year to reflect the relationship between the environment and the sectors, to ensure the observation of some activities with environmental impacts in the time series, and monitoring of the results of the applied environmental policies, to help determine the plans, programs and policies, to prepare legislation and to provide information.

Graph 55 - Number of the Environmental Indicators Published by Years and Headings (Ministry of Environment and Urbanization, 2020)



Primarily, "Environmental Indicators 2006" was prepared and published in cooperation with the Turkish Statistical Institute. While this booklet covered 11 headings and 24 indicators, the booklets have been renewed and improved over time, and the "Environmental Indicators 2017" booklet covering 16 headings and 87 indicators has been prepared. The Environmental Indicators Booklet is published as an electronic booklet at http://ced.csb.gov.tr/cevselengostergeler-kitapcigi-i-82681. Also http://cevselengostergeler.csb.gov. It is available in Turkish at http://cevreselgostergeler.csb.gov. tr/ and in English at https://environmentalindicators.csb.gov.tr/. Provincial-level environmental indicators are also published at http://cevevregostergeler.csb.gov.tr/.

H.8.2. Publications

The following publications are prepared and published in the "Publications" section of the website of Directorate General of Environmental Impact Assessment, Permit and Inspection (https://ced.csb.gov.tr/) of the Ministry of Environment and Urbanization.

- Technical Activity Report of General Directorate of Environmental Impact Assessment, Permit and Inspection
- Environmental Inspection Statistics Bulletin
- Hazardous Waste Statistics Bulletin
- Non-Hazardous Waste Statistics Bulletin
- Medical Waste Statistics
- Environmental Problems and Priorities Report
- Provincial State of Environment Reports
- State of Environment Reports Provinces Summary
- Environmental Indicators Booklet

H.9. European Union Environmental Investments

H.9.1. Environment Operational Programme (IPA-I Period 2007-2013)

The Ministry of Environment and Urbanization made an application to the European Commission for 39 environmental infrastructure projects, with a total budget of approximately 981 million Euros, for the IPA-I period which covers the 2007-2013 programming years and of which the implementation period was completed by the end of 2017.

30 infrastructure projects, 3 of which are on solid waste and 27 of which are on water and wastewater projects, with a total budget of approximately 700 million Euros, and 7 technical assistance projects (preparation of project preparation documents, training, visibility, institutional capacity increase, etc.) have been put into practice. Of the 27 water projects in question; 4 of them are on drinking water, 16 of them are on wastewater, and 7 of them are on integrated water projects that include both drinking water and wastewater. The list of projects is given in Table 111, and their distribution on the map is given in Map 32.

Table 111 - Projects out into practice in IPA I (2007-2013) period
(Ministry of Environment and Urbanization, 2020)

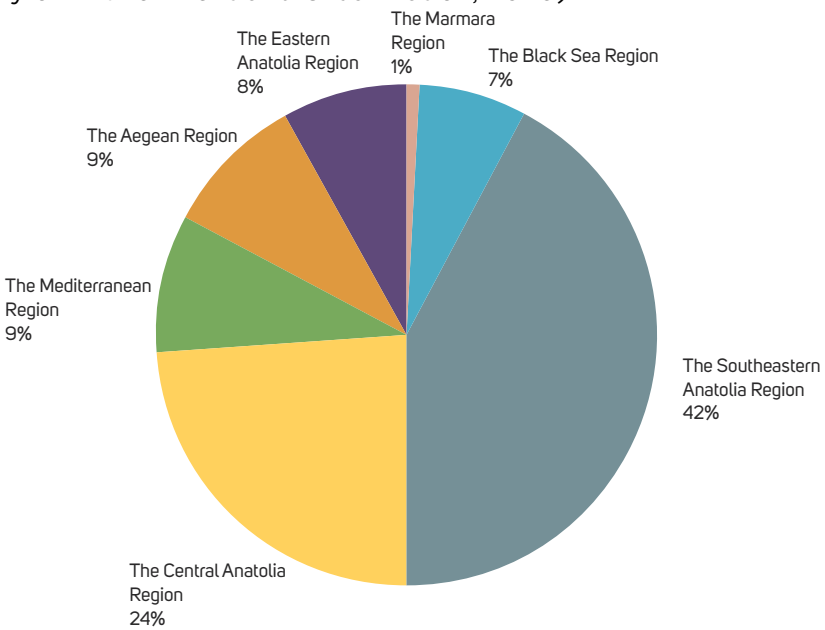
No	PROJE ADI
1	Mardin Wastewater Project
2	Diyarbakir Water and Wastewater Project
3	Siverek Wastewater Project
4	Erzincan Water and Wastewater Project
5	Erzurum Water and Wastewater Project
6	Doğubayazit Drinking Water Project
7	Şanlıurfa Water and Wastewater Project
8	Kahramanmaraş Water and Wastewater Project
9	Ordu Water and Wastewater Project
10	Çorum Solid Waste Management Project
11	Ceyhan Wastewater and Rainwater Project
12	Erciş Drinking Water Project
13	Bulancak Water and Wastewater Project
14	Konya Solid Waste Management Project
15	Adıyaman Water and Wastewater Project
16	Balikesir Solid Waste Management Project
17	Kütahya Water and Wastewater Project
18	Polatlı Water and Wastewater Project
19	Amasya Water and Wastewater Project
20	Akçabat Water and Wastewater Project
21	Manavgat Water and Wastewater Project
22	Nizip Water and Wastewater Project
23	Erdemli Water and Wastewater Project
24	Lüleburgaz Water and Wastewater Project
25	Akşehir Water and Wastewater Project
26	Silvan Drinking Water Project
27	Bartin Water and Wastewater Project
28	Soma Water and Wastewater Project
29	Merzifon Water and Wastewater Project
30	Seydişehir Water and Wastewater Project

Map 32 – Regional Distribution of Projects Put into Practice Under IPA I
(Ministry of Environment and Urbanization, 2020)

Approximately 9 million citizens have had the opportunity to live in a cleaner environment in accordance with EU standards as a result of this project package covering covers a total of 25 provinces and 44 municipalities in our seven geographical regions.

The distribution of the population benefited from the Environmental Operational Programme by regions is given in Graph 56.

Graph 56 – Distribution of the Population Benefited from the Environment Operational Programme by Regions
(Ministry of Environment and Urbanization, 2020)



H.9.2. Implementation Activities

The Environment and Climate Action Sector Operational Program (IPA-II Period 2014-2020)

The Environment and Climate Action Sector Operational Program, which covers the programming years 2014-2020 and of which implementation period will be completed by the end of 2025, aims to combat climate change better, advance Turkey's alignment with the EU acquis concerning the European Union (EU) climate change policy, protect the environment and improve the quality of citizens' life. The goals of the programme are given below:

- Improving the quality of citizens' life by strengthening the environmental infrastructure,
- Protecting nature,
- Ensuring the compliance of Turkey with the EU environmental and climate change acquis,
- Carrying out activities on reducing climate change and increasing resistance to its effects.

These goals will be achieved through 3 main actions:

- Action 1: Water
- Action 2: Waste
- Action 3: Environmental Management for Sustainable Development

There are a total of 34 infrastructure projects with a total budget of approximately 740 million Euros in the infrastructure project pool of the IPA-II period. 23 of these projects are water/wastewater projects and 11 of these projects are solid waste projects. There are 40 projects with a total budget of approximately 150 million Euros in the IPA II Period capacity building project pool. However, the Operational Program continues with a total of 40 projects, 22 of which are infrastructure and 18 technical support projects, for the years 2014-2020 due to the budget cuts implemented by the EU.

Budget allocations for the years 2014-2019 were finalized, and the EU declared that there would be no budget allocations for 2020. In this case, approximately 335 Million Euros was allocated for the Environment and Climate Action Sectorial Operational Program covering the years 2014-2020. The list of 40 projects of which programmings were completed within the scope of Programme for the years 2014-2020 is given in Table 112.

Table 112 – Project List for IPA-II Period (2014-2020)
(Ministry of Environment and Urbanization,)

Number	NAME OF THE PROJECT
1	Sorgun Wastewater Project
2	Çarşamba Wastewater Project
3	Şırnak Water and Wastewater Project
4	Kastamonu Wastewater Project
5	Yüksekova Wastewater Project
6	Elbistan Wastewater Project
7	Bismil Wastewater Project
8	Bandırma Integrated Water Project
9	KASMİB Solid Waste Project
10	Niksar Water and Wastewater Project
11	Trabzon Water Supply Project
12	Iğdır Wastewater Project
13	Sivas Kızılırmak Right and Left Banks Wastewater Collector Project
14	Rize Wastewater Project
15	Hakkari Integrated Solid Waste Management Project
16	Giresun Wastewater Project
17	Çankırı Wastewater Project
18	Doğubayazıt Wastewater Project
19	Tunceli Integrated Solid Waste Management Project
20	Suluova Wastewater Project
21	Bozüyük Water Supply and Wastewater Collection Project
22	Aksaray Integrated Water Project
23	Improving Air Quality and Raising Public Awareness in Cities in Turkey-CITYAIR (in line with CAFÉ Directive)
24	Technical Assistance Project for Supporting the Management and Implementation of the Environment and Climate Action Sectorial Operational Programme
25	Determination of Industrial Emissions Strategy of Turkey in Accordance with Integrated Pollution Prevention and Control (DIES)
26	Technical Assistance to Conduct Chemical Safety Assessments Under the Scope of REACH Regulation
27	Training for the Institutional Capacity Building on Climate Change Adaptation
28	Identification and Remediation of Contaminated Sites with Persistent Organic Pollutants Project
29	Project "Enhancing Adaptation Action in Turkey"
30	Project "Addressing of Invasive Alien Species threats in terrestrial areas and inland waters in Turkey"
31	Preparation, Implementation and Monitoring of Species Action Plans for Endangered Species in Turkey within the Concept of a New Methodology

Number	NAME OF THE PROJECT
32	Project "Technical Assistance to Enhance the Capacity of AFAD in the Adaptation and Reduction of Disaster Risks resulting from the Climate Change in Turkey"
33	Supporting the Implementation of By-Law on Strategic Envrionmental Assessment
34	Preparation of River Basin Management Plans for 6 Basins
35	Project on water protection against agricultural contamination
36	Technical Assistance to Prepare Flood Risk Management Plan for Meriç — Ergene River Basin
37	Project on Capacity Building in the field of Waste Management
38	Technical Assistance for Harmonization of Regulation (EU) No. 528/2012 on Biocidal Products (BPR)
39	Building a Disaster Resilient Turkey (AFAD)
40	Technical Assistance for Increasing Efforts in the Field of Climate Change

The Operation Description Documents of 33 projects in the Table 18 of which are infrastructure and 15 of are capacity building, have been approved by the Delegation of the European Union to Turkey. The remaining 7 projects are in the revision and approval phase, and they are aimed to be financed with possible savings that will occur during the implementation period.

H.10. European Environment Agency Studies

The European Environment Agency (EEA), which was officially established in 1990 with the 1210/90 Council Regulation, started to operate in Copenhagen in 1994. The EEA is the European Union (EU) institution in charge of providing accurate, independent information on the environment. The current 33 members comprise Iceland, Liechtenstein, Norway, Switzerland and Turkey together with 28 EU Member States. Turkey became a member of the EEA on 1 May 2003 with the "Agreement between the European Community and the Republic of Turkey concerning Turkey's participation in the European Environment Agency and the European Environment Information and Observation Network" published in the Official Gazette No. 25052 dated 18.03.2003.

H.10.1. Abroad Activities Participated by Turkey

Workshops and meetings are held annually and regularly by the EEA on the subjects identified in line with the EEA 5-Year Strategy. Furthermore, online EEA webinar meetings on various subjects are also held with online participation. Primary Focal Points, representatives of relevant institutions and the National Focal Point have attended the said meetings and webinars.

Meeting, Workshop and Webinar

115 abroad meetings-workshops were organized by the EEA in 2015-2019 and a total of 152 Turkish experts participated in these events. Moreever, the experts working in institutions in our country participated online in 62 webinars in the same years.

EEA Executive Board Meetings

The EEA Board of Directors convenes 3 times a year and takes decisions in accordance with the report and agenda submitted by the Executive Director. The member countries are represented by the top executive with decision-making powers in the EEA Board of Directors. Our country participated in 15 meetings between 2015 and 2019.

EEA National Focal Points Meetings

Three meetings are held a year by the European Environment Agency with the participation of the focal points of the member countries. Up-to-date information on EEA work is provided and the problems faced by the member countries are addressed and solutions are discussed at these meetings. Our country participated in 15 meetings between 2015 and 2019.

H.10.2. Activities Carried Out in Our Country

Various meetings and visits were held in our country between 2015 - 2019. Detailed information can be accessed in the EEA Activities Booklets for 2015-2019. These activities are summarized below.

- SOER 2015: The European Environment -State and Outlook Report Publicity Meeting (7 May 2015)
- European Environment Agency - EIONET Training (7-8 May 2015)
- European Environment Agency Country Visit (7-8 March 2017)
- European Environment Agency Water Reporting Training (24-25 April 2017)
- Air Quality Reporting Meeting (11 October 2018)
- European Environment Agency ENI Istanbul Regional Workshop for Eastern Countries (27-28 November 2018)
- Information Meeting of the European Environment Agency on Air Quality Studies (3 January 2019)
- European Environment Agency Maritime Meeting (12 March 2019)
- European Environment Agency - National Meeting of Primary Focal Points (18 September 2019)
- European Environment Agency - Sustainable Development Goals (SDG) Webinar (10 October 2019)
- Visit of European Environment Agency Officials to Turkey (20-21 November 2019)
- European Environment Agency - Online Monitoring of SOER Official Promotion (04 December 2019)

Picture 11 - EEA Primary Focal Points Meeting - 2019

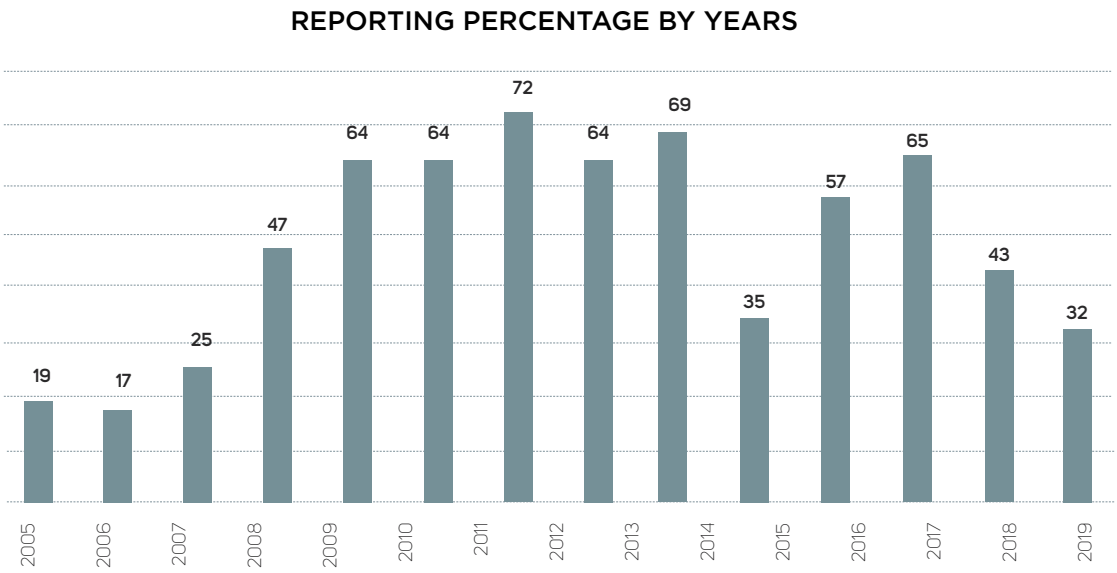
H.10.3. Reporting to the European Environment Agency

There are reports that we are obliged to make every year due to our membership to the EEA. The subjects and format/content of the reports are determined by the EEA.

Our country currently reports to the EEA under 10 subjects. These are Air Quality Assessment Methods, Long-range Transboundary Air Pollution, Primary Validated Assessment Data, Nationally Designated Areas, Biological Data in Transitional and Coastal Waters (WISE 2), Water Quantity (WISE 3), Water Quality (WISE 4, WISE 6), Water Emissions (WISE 1) and Spatial Data (WISE 5).

Reporting is made by the relevant Primary Focal Points (BON) under the coordination of the National Focal Point. Timely and complete reporting affects the score of the countries in the Priority Data Flow Report prepared by the EEA. Reporting percentages by years are given in Graph 57 below.

Graph 57 - Reporting Percentages of Turkey by Years



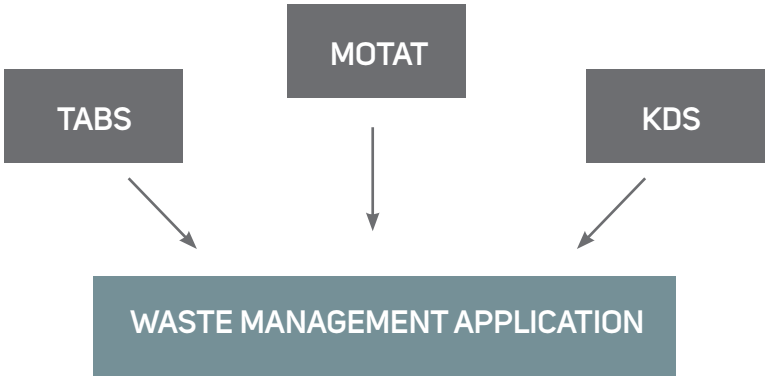
More detailed information on EEA activities is available on https://aca.csb.gov.tr/.

H.11. Innovations in the Field of Environment

H.11.1. Waste Management Application

The Waste Management Application (ATYÖN) is an online application prepared to follow the process online from the source of industrial wastes generated in our country until they go to Waste Treatment Facilities with Environmental Permits and Licenses and is included in the Integrated Environmental Information System of the Ministry of Environment and Urbanization. The application serves through the e-government gateway on https://ecbs.cevre.gov.tr/.

Figure 11 -Waste Management Application



ATYÖN includes Waste Declaration System (TABS), Mobile Waste Tracking System (MoTAT) and Mass Balance System (KDS). TABS is the system where waste producers annually declare the code, quantity and status information regarding the waste that they produce in their facilities and sent it to waste processing facilities within the scope of the By-Law on the Waste Management. These declarations express the declaration of the waste produced in the previous year of the declaration. Hazardous and Non-Hazardous Waste Statistics Bulletin and Medical Waste Statistics Bulletin are prepared using the data obtained from TABS. Bulletins are published on https://ced.csb.gov.tr/; the official website of the Ministry of Environment and Urbanization. In addition, TABS waste data can be accessed on the dynamic reporting screen at the same address.

Figure 12 - Hazardous and Non-Hazardous Waste Statistics Bulletin

MoTAT is an online system prepared within the scope of the Communiqué on Transportation of Wastes by Road Transport, to record the information regarding each waste transportation process from its source, to monitor en-route transits of the waste-loaded vehicles, and to effectively control the waste transportation operations.

Map 33 - MoTAT Road Transport Map

It is ensured that en-route transits of the waste-loaded vehicles are monitored and waste transportation operations are effectively controlled thanks to the mobile devices mounted to waste vehicles. License procedures regarding the waste transportation companies and vehicles have also been carried out through MoTAT since 2010. MoTAT has been a fully electronic system and has been integrated with KDS since 2018.

KDS is used by waste treatment facilities. It is the system in which the recovery/disposal activities of the wastes accepted into the facility under their licenses are conducted. It comprises the waste information regarding the product produced from the waste processed by the facility and the residual waste.

Monitoring the waste data cycle (waste production-transport-recovery/disposal) and developing the strategies for the waste management of the Ministry and creating a waste inventory accessible to all stakeholders are aimed through the Waste Management Application.

H.11.2. Project to Support the Implementation of the By-law on Strategic Environmental Assessment

The "Project to Support the Implementation of By-Law on SEA" numbered (TR2018 ESOP MI A3 12) prepared for the Second Period of the Instrument for Pre-Accession Assistance (IPA), to be conducted between 2014 and 2020, started on 18 April 2019. The project in question is financed by the European Union and our country.

The overall goal of the project is to contribute to the preeminent protection of the environment by integrating environmental issues into the preparation and approval processes of the plans and programs that are likely to have significant impacts on the environment within the scope of the EU harmonization process.

"The Project to Support the Implementation of the By-Law on Strategic Environmental Assessment" will be carried out for 18 months, and the project aims for implementation and expansion of the By-Law on Strategic Environmental Assessment throughout our country in accordance with the EU SEA Directive and strengthening the institutional capacity. The project activities include conducting the SEA process in 2 pilot sectors (agriculture and integrated coastal areas management) among the priority sectors of SEA, organizing 4 Awareness Raising Workshops on Strategic Environmental Assessment and 4 Sectoral Training Programs on Strategic Environmental Assessment.

Training Needs Analysis and Gap Analysis Reports have been prepared so far within the scope of the project. 2 Awareness Raising Workshops on SEA were held for Universities, NGOs, Chambers and the Public on 3 December 2019 and 11 February 2020 in Ankara. SEA Training Program was held in the tourism sector in Ankara on 4-5 December 2019 and in the water management sector on 12-13 February 2020. "Edirne-Kırklareli-Tekirdağ ICZM Plan" and "North Aegean Nitrate Action Plan" were determined as 2 pilot plans to be carried out during the SEA Process. 3 working meetings were held in each pilot sector. Scoping Meetings and field visits were held, and SEA Scoping Reports were approved. Draft SEA Reports are presented. The web page has been updated. [www.scd.csb.gov.tr]

H.11.3. Project on the Improvement of By-Law on Environmental Impact Assessment

The "Project on the Improvement of the By-Law on Environmental Impact Assessment" was initiated on 11 February 2019 and finalized on 30 June 2020 by the Ministry of Environment and Urbanization.

Under the project; working meetings were held on the By-Law and the Qualification Communiqué on EIA, monitoring-inspection, public participation and social impact assessment, activities included in the By-Law on EIA Annex-1 and Annex-2 list, Assessment Report on Court Decisions was prepared for the By-Laws on EIA and their annexes and for the processes of lawsuits filed against the articles of By-Laws on the EIA, field studies were conducted through holding surveys, face-to-face interviews and meetings with stakeholders to obtain feedback on the By-Law on EIA, Assessment Report regarding the By-Law on EIA was prepared within the scope of gap analysis, evaluation of the administrative issues and annex lists of the By-Law on EIA and the public participation activation process, Sectoral EIA Seminars were organized in mining, waste and chemistry, power generation facilities, industry and coastal port facilities sectors, an EIA Report Scoring Software was prepared for scoring the EIA Reports objectively and allowing the subjective decisions in the report to be recorded quantitatively and the "Draft By-Law on EIA" was prepared by revising the current By-Law on EIA and its annex lists in accordance with today's needs with scientific and technical reasons.

H.11.4. Project on Planning of Environmental Inspections

The Project on Planning of Environmental Inspections, started in 2011 to ensure the environmental inspections plannings based on the environmental risk analysis, was completed on 18 April 2013. An inpection plan specific to Samsun province was prepared through the developed integrated risk assessment method. The application was developed after Samsun Province and expanded in other provinces. Inspection programs were prepared for 58 Provincial Directorates Samsun, Edirne, Kırklareli, Tekirdağ, Kocaeli, Bursa, Sakarya, Bilecik, Yalova, İzmir, Kütahya, Eskişehir, Uşak, Balıkesir, Manisa, Konya, Isparta, Burdur, Afyonkarahisar, Adana, Nevşehir, Kayseri) , Osmaniye, Gaziantep, Kilis, Hatay, Düzce, Zonguldak, Bartin, Karabük, Kastamonu, Çankırı, Çorum, Sinop, Amasya, Tokat, Yozgat, Sivas, Van, Hakkari, Bitlis, Siirt, Trabzon, Giresun, Ordu, Rize, Gümüşhane , Erzincan, Elazığ, Malatya, Adıyaman, Kahramanmaraş, Şanlıurfa, Diyarbakır, Mardin, Batman, Şırnak and Muş) by using the Risk Assessment Method as of 2019.

H.11.5. Capacity Building Project for BEKRA Internal Emergency Plans

The "Capacity Building Project for BEKRA Internal Emergency Plans", started to be carried out by the Ministry of Environment and Urbanization on 12/6/2019, continued for 6 months. The project had a budget of 245,000 TL and was completed on 20/12/2019.

Training and pilot studies were carried out in 6 regions selected throughout Turkey with the participation of the central organization personnel of the Ministry of Environment and Urbanization and the inspection personnel of 81 Provincial Directorates of Environment and Urbanization within the scope of the project. As well as the training activities; studies for updating the Communiqué on the Internal Emergency Plans (IEP), preparation of guides and checklists forming the basis of IEPs, institutional capacity analysis, action plan were conducted and recommendation document for operators were prepared within the scope of the project.

With the project, the awareness and knowledge level of the inspection personnel in 81 Provincial Directorates of Environment and Urbanization was increased, and guidelines and checklists were prepared to carry out standard and effective IEP inspections in each Provincial Directorate.

H.11.6. Technical Assistance for Increased Capacity for Transposition and Capacity Building on Fluorinated Greenhouse Gases(F-Gases)

Technical Assistance for Increased Capacity for Transposition and Capacity Building on Fluorinated Greenhouse Gases(F-Gases) carried out under IPA, of which the Ministry of Environment and Urbanization was the beneficiary, was initiated in May 2017 and concluded in August 2020.

The project aims to reduce human-induced greenhouse gas emissions and to comply with EU climate policy legislation for contributing to global efforts on prevention of climate change, to increase the national capacity, and to develop international capacity on F-gases for preparing the legislation to the activities on prevention of climate change. With the project, F-gas emission calculations and reporting were developed by establishing an electronic database and training and certification system for the fluorinated greenhouse gases and equipment containing fluorinated greenhouse gas.

It is to provide technical and technological support for the transition to alternative gases and technologies by presenting the current utilization conditions of hydrochlorofluorocarbons, one of the ozone layer depleting substances used in our country in the cooling and foam industries. Terminating the ozone layer depleting substances in our country, raising the awareness of the Customs Directorates and end-users of the ozone layer depleting substances in our country and carrying out pilot projects were targeted and implemented within the scope of the project.

H.11.7. The Institutional Strengthening Project for the National Ozone Unit

The Institutional Strengthening Project for the National Ozone Unit (IS) started to be implemented in 1992 after our country became a party to the Montreal Protocol. Phase I of the project was implemented between 1992-2000 and has been renewed every 2 years until today.

The implementing agency of the Institutional Strengthening Project Phase 9 is the United Nations Industrial Development Organization (UNIDO). The purposes of the project are to support the strengthening of the administrative and technical capacity of the Ministry of Environment and Urbanization, namely the National Ozone Unit, on implementing the Montreal Protocol and other relevant national and international legislation for the protection of the ozone layer. Activities are carried out as publications, workshops and

educational activities under the subjects of developing legislation, raising public awareness and informing, strengthening institutional technical infrastructure.

There are 16 September the International Day for the Preservation of the Ozone Layer, and the Ozone Panel, which is held once a year, where public institutions, non-governmental organizations and sector representatives are met and the information about the current and conducted studies and the quotas of the next year are shared based on these activities.

Funds have been allocated for training and information meetings on the amendments and arrangements to be made in the national legislation with the adoption of the Montreal Protocol Kigali Amendment in the new phase of the project.

"Montreal Protocol Kigali Amendment Enabling Activities Project" is carried out to provide support on issues of ratification of the Kigali Amendment, supporting the initiation of institutional arrangements, the establishment of a licensing system for HFCs, development of data collection methodologies as well as the HFC reduction processes to the developing countries (Article 5 countries), including our country under the Montreal Protocol. Informative meetings are held with public institutions and related sectors in our country on the benefits of the amendment, workshops are organized for the relevant sectors, and studies are carried out for the transition to natural alternatives and alternatives with low global warming potential within the scope of these.

H.11.8. Technical Assistance for Capacity Building on European Pollutant Release and Transfer Register in Turkey

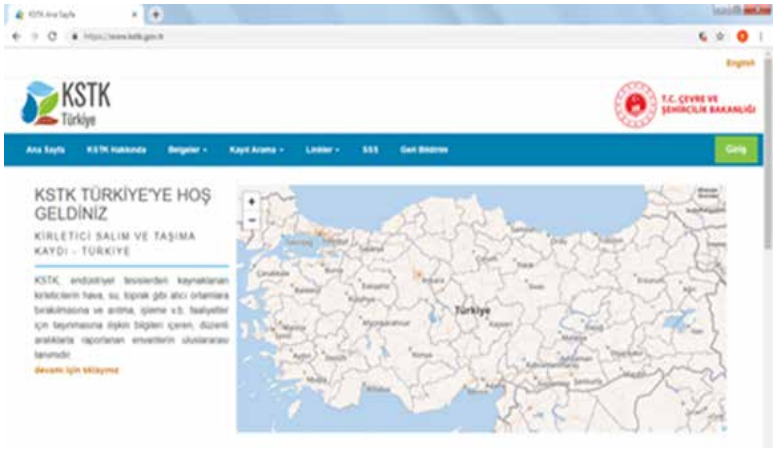
Turkey has been an OECD member country since 1960, so there is an expectation to establish A Pollutant Release and Transfer Register (PRTR) system. Moreover, harmonization of the PRTR System in line with the "Turkey 2008 National Programme for the Adoption of the Acquis." in 2009 and later, and its implementation with the membership are planned.

The " Technical Assistance for Capacity Building on European Pollutant Release and Transfer Register in Turkey (PRTR)" was completed on 25.05.2019 for the adoption of the E-PRTR Regulation (EC) No. 166/2006.

Picture 12 - PRTR Project Seminars

Establishing the National PRTR System, increasing the administrative and technical capacity in the competent authorities and priority groups, and raising the awareness of priority groups and decision-makers were aimed under the project submitted to IPA 2013 1st Component.

Picture 13 – PRTR Project-National PRTR Website



The " Draft National PRTR Legislation ", "Legislation Implementation Strategy" and "Regulatory Impact Analysis" and " Inventory and Inventory Report of Industrial Facilities " were prepared within the scope of the project. The software system was tested by creating Web - Based National KSTK Reporting Software. National PRTR Website (Photograph 13) was created (https://kstk.csb.gov.tr/).

Furthermore, guidelines and brochures on reporting were prepared, protocols were signed with 19 pilot facilities and field visits were carried out. 10 seminars were held throughout Turkey. A 3-week Training of Trainers Program was carried out to create PRTR reporting trainers.

Picture 14 – PRTR Project - Facility Visits

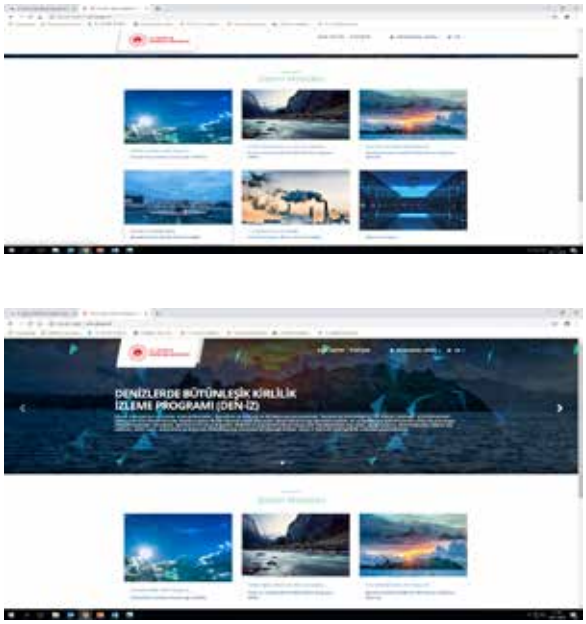
H.11.9. Standardization, Integration, and Modernization of Measurement Systems Project (SIM Phase II)

A Continuous Monitoring Center (Picture 15) was established at the Gölbaşı Campus of the Ministry of Environment and Urbanization within the scope of the Standardization, Integration and Modernization of Measurement Systems (SIM) Project (2016-2020).

Picture 15 - Continuous Monitoring Center

The project is carried out in two phases and the first phase was completed at the end of 2017. In the first phase, the integration of the data was provided to the SIM software by putting into practice the Continuous Monitoring Center (SIM). https://sim.csb.gov.tr/ web page (Picture 16) has been created.

Picture 16 – Website of the Continuous Monitoring Center sim.csb.gov.tr



The project aims to ensure effective management of the basin, marine and air eliminator environment monitoring data produced by the Ministry of Environment and Urbanization, and those obtained from continuous wastewater monitoring systems (CWMS) and continuous emission measurement systems (CEMS), to establish early warning systems, to develop data-based policies and to direct decision-making mechanisms, financial support and incentives.

Data obtained from Continuous Monitoring Systems (Air Quality, CWMS and CEMS) have been transferred to the SIM platform. 355 Air Quality Monitoring Stations, 290 Wastewater Monitoring Stations, 739 Emission Monitoring Stations can be continuously monitored, managed and reported.

Mapping, graphics and reporting processes can be performed by transferring the integrated monitoring data in the marines through 353 monitoring stations and domestic and industrial pollution monitoring data through 109 wastewater treatment plants and 29 receiving environment monitoring stations to SIM software. Phase II activities of the Project are ongoing for providing new data integrations to SIM, developing reports within the scope of national and international obligations and meeting the central support and software needs of the current SIM. Phase II will be completed by the end of 2020.

At this point, the users authorized within the scope of the procedure determined by the Ministry of Environment and Urbanization can access the reports on basin, sea, air quality, CWMS, CEMS on more than 700 reporting screens created with databases integrated into the first stage within the framework of their authorities via www.sim.csb.gov.tr.

Furthermore, National Air Quality Mobile Application, QR Code Based Field Staff Mobile Application with Status Inquiry, Questioning Status with QR code, Environmental and Marine Pollution Notification Application, Marine Data Entry Application, Basin Data Entry Application, and Executive Summary Mobile Application operating on IOS and ANDROID platforms have been established within the scope of the project. the National Air Quality mobile application, of these mobile applications, has been published from the Play Store and Apple Store Markets.

Picture 17 – SİM Mobile Applications

Environmental monitoring data obtained from SIM has started to contribute to the Provincial Directorates of Environment and Urbanization, relevant units of the Ministry of Environment and Urbanization and academic studies.

H.11.10. Project on Providing Inspection Capability to the Waste Declaration System and Improving Waste Management

Moving into a waste declaration system with an effective inspection function that will support provincial organizations and waste producers by improving the waste declaration system and achieving a better waste management system by increasing the efficiency of sectoral waste lists and monitoring and inspection activities are aimed under the "Project on Providing Inspection Capability to the Waste Declaration System and Improving Waste Management".

Sectoral waste lists and waste generation factors have been constituted by studying 119 sectors /sub-sectors (facility economic activity code - NACE) in detail in line with these goals. Waste production factors of the sectors included in the waste declaration system have been determined.

The software comprising the sectoral waste lists and waste production factors has been developed and integrated into the TABS under the project. The recently developed TABS screens have been tested with facilities operating in machinery and equipment manufacturing, white goods manufacturing, metal salts and basic inorganic chemicals manufacturing, engine manufacturing, primary form polymers manufacturing, pharmaceutical production and ore enrichment. Thus, the on-site verification activities have been carried out for the waste lists as one of the project outputs.

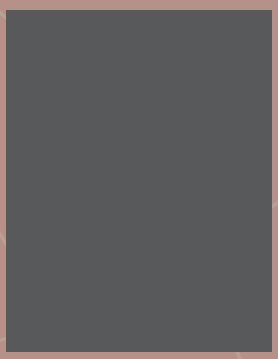
Implementation of the renewed waste declaration screens is planned for the end of the project. Waste declarations will be made in a better way and more accurate waste data will be obtained thanks to this developed software.

Sectoral Inspection Sheets have been prepared for the sectors studied in detail in the project to be used in monitoring and inspection activities aimed at improving waste management and the documents that will guide the inspectors have been created. Moreover, the "environmental permit and license" guide, addressing the principles to be followed in the process of granting permits / licenses to waste processing facilities, has been prepared for the "Sludge Drying" and "Jewellery Processing and Recycling" sectors within the scope of the project.

Sources

Ministry of Environment and Urbanization

I. ENVIRONMENTAL PROTECTION COSTS AND LIABILITY INSURANCE



I. ENVIRONMENTAL PROTECTION COSTS AND LIABILITY INSURANCE

I.1. Environmental Protection Expenditures

Environmental protection expenditures increased by 11.6% in 2018 compared to the previous year and were 38.2 billion TL in total. 56.6% of environmental protection expenditures were spent by financial and non-financial companies, 36.3% of those were spent by non-profit organizations serving the general government and households, and 7.1% of those spent by households.

47.5% of environmental protection expenditures were spent for waste management services, 35.6% of those were spent for wastewater management services, 6.8% of those were spent for protection of biological diversity and landscape, 3.6% of those were spent for protection and quality improvement of soil, groundwater and surface waters and 6.5% of those were spent for other environmental issues.

63.8% of environmental protection investment expenditures, which was 7.1 billion TL in total, were spent by financial and non-financial companies and 36.2% by the general government. While 3.1 billion TL was spent for wastewater management services and 1.8 billion TL was spent for waste management services, 2.2 billion TL was spent for environmental protection in other matters.

While the share of environmental protection expenditures in the gross domestic product was 1.1% in 2017, it was 1% in 2018.

Table 113 - Environmental Protection Expenditures (2013-2018)
(TURKSTAT, 2020)

Year	Total expenditure (million TL)	Change compared to the previous year (%)	Investment expenditure (million TL)	Share of investment expenditure in total expenditure (%)
2013	21,372	-	2,905	13.6
2014	24,514	14.7	3,557	14.5
2015	25,537	4.2	3,817	14.9
2016	27,605	8.1	4,217	15.3
2017(r)	34,234	24.0	5,755	16.8
2018	38,215	11.6	7,146	18.7

(r) Revised

I.2. Environmental Liability Insurance

Under the 13th Article of the Environmental Law, those who engage in production, sales, storage, use, and transportation of dangerous chemicals and who engage in the collection, transportation, temporary and interim storage, recycling, reuse, and disposal of hazardous wastes are obliged to have dangerous chemical and hazardous waste liability insurance against the damages they may cause to third parties as a result of an accident during their operational activities. The concept of risk accompanies that of insurance, which requires the risk to be secured. In this sense, environmental liability insurance is used today as a tool in the management of environmental risks. Organizations that have the potential to pollute the environment are able to secure possible environmental risks and damages to third parties in case of any harm to the environment.

Within the scope of environmental legislation, the General Conditions of Compulsory Marine Pollution Financial Liability Insurance for Coastal Facilities came into force on 01 July 2007, the General Conditions of Hazardous Substances and Hazardous Waste Compulsory Liability Insurance came into force on 11 May 2010, and the General Conditions of Environmental Pollution Liability Insurance came into force on 01 September 2011.

The General Conditions of Compulsory Marine Pollution Financial Liability Insurance for Coastal Facilities compensates for the cleaning costs caused by the pollution or pollution danger arising from the inland waters, territorial waters, continental shelf, and the exclusive economic zone of Turkey as a result of the incident arising from the coastal facilities, costs to be made for the transportation of the collected wastes, damages stemming from the injury and death of third parties, and damages that may be inflicted on private properties. The number of policies issued in 2019 regarding the said insurance was 547 and the premium production was 7,207,584 TL.

Table 114 - Coastal Facilities Marine Pollution Compulsory Liability Insurance

(Association of the Insurance and Reinsurance Companies of Turkey, Insurance and Private Pension Regulation and Supervision Agency 2020)

	2016	2017	2018	2019
Number of Policy	523	563	560	547
Amount of Premium (TL)	4,688,656	5,564,475	6,764,263	7,207,584

With Environmental Pollution Liability Insurance guarantees the compensation claims that the insurer is obliged to legally pay the policyholder within the framework of the Environmental Legislation due to the sudden and unexpected pollution risk or pollution, of one or several, of the soil, groundwaters, inland waters and seas, air depending on the scope of the contract conditions. With this insurance, the insurer compensates the costs of material damage, death, disability and bodily injury caused by the pollution due to the activities specified in the policy of the facility specified in the policy and the cleaning costs made outside the facility specified in the policy due to the danger of contamination or contamination,

the transportation and disposal costs of the collected wastes. The number of policies issued in 2019 regarding the said insurance was 69 the premium production was 25,666 TL.

Table 115 - Environmental Pollution Liability Insurance
(Association of the Insurance and Reinsurance Companies of Turkey, 2020)

	2016	2017	2018	2019
Number of Policy	27	38	50	69
Amount of Premium	621	112,833	25,516	25,666
(TL)				

Sources

Turkish Statistical Institute

Association of the Insurance and Reinsurance Companies of Turkey

Insurance and Private Pension Regulation and Supervision Agency

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