REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

REPUBLIC OF TURKEY MINISTRY OF ENVIRONMENT AND URBANISATION
GENERAL DIRECTORATE OF ENVIRONMENTAL IMPACT ASSESSMENT
PERMIT AND INSPECTION
Environmental Inventory and Information Management Department

ENVIRONMENTAL INDICATORS 2015

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FOR YOUR INFORMATION REQUESTS AND QUESTIONS ABOUT RELEASE CONTENT
Environmental Inventory and
Information Management Department
Data Evaluation Division
Tel: +90 (312) 410 17 00
Fax:+90 (312) 419 21 92
e-mail: cebyd@csb.gov.tr
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T.R. MINISTRY OF ENVIRONMENT AND URBANISATION
GENERAL DIRECTORATE OF ENVIRONMENTAL IMPACT ASSESSMENT, PERMIT, AND INSPECTION
Mustafa Kemal Mahallesi Eskişehir
Devlet Yolu (Dumlupınar Bulvarı) 9. km
No: 278 Çankaya / Ankara.

PRODUCTION

This booklet is based on the data generally from 2015, while the data about some subject headings which are gathered at the end of the following year. Therefore, the data under these subject headings are from 2014 . In particular, data in the booklet under the emissions of greenhouse gases and air pollutants headings are generally issued in 2014.

While our country continues its development, protection and improvement of the environment are our main targets. At this point, it is important to closely monitor the change in the environment, to see the results of the legislation and practices in the field of environment, and to make new legislations when necessary.

It is important to use environmental indicators correctly in all studies in order to inherit a healthy environment to next generations by providing a summary and result-oriented perspective.

As the Ministry of Environment and Urbanisation, the reason for the preparation of the Environmental Indicators booklet is to reflect the relationship between the environment and all sectors, to keep track of changes in time and to produce understandable results.

I hope that “Environmental Indicators 2015” booklet which is prepared by the current data will inform the public, guide all institutions and organizations related to the environment, and also guide them in decision-making processes.

Mehmet ÖZHASEKİ
Minister of Environment and Urbanisation

OTHER PUBLICATIONS

Issue No. 1: Ankara Province Environmental Status Report, 1994

Issue No. 2: Provincial Environmental Problems and Priorities Inventory Assessment Report, 1996

Issue No. 3: Industries Affecting Environment Primarily and Main Sector Activities, 1996

Issue No. 4: Environmental Atlas of Turkey 96, 1997

Issue No. 5: Environmental Status Report of Turkey, 2007

Issue No. 6: Inventory of Environmental Problems and Priorities Assessment Report of Turkey (2005 - 2006), 2008

Issue No. 7: Environmental Indicators 2008, 2009

Issue No. 8: Environmental Indicators 2009, 2010

Issue No. 9: Inventory of Environmental Problems Priorities Assessment Report of Turkey 2007-2008, 2010

Issue No. 10: Environmental Indicators 2010, 2011

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Issue No 25: Environmental Inspection Report 2014, 2015

Issue No 26: Environmental Status Report - 2013 Annual Summary – Provinces

Issue No 27: Environmental Indicators 2014, 2015

Issue No 28: Environmental Inspection Report 2015, 2016

Issue No 29: Environmental Status Report – 2014 Annual Summary – Provinces, 2016

Issue No 30: Environmental Status Report of Turkey 2015, 2016

Issue No 31: Environmental Problems and Priorities Assessment Report of Turkey 2013, 2015

Issue No 32: Environmental Problems and Priorities Assessment Report of Turkey 2014, 2016

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CLASSIFICATION OF INDICATORS

In the World, various approaches are applied related to developments of environmental indicators; indicator sets are created within different conceptual frameworks or models. One of them is, "Pressure, State, Response" (PSR) framework. In 1994, the OECD (Organization for Economic Cooperation and Development) developed and established a comprehensive indicator system in order to provide a basis for reporting environmental policies. Another model, DPSIR was produced developing the framework of PSR by EEA (European Environment Agency) in 2004 to define the relationship between the society and the environment. This model contains five elements; "driving force, pressure, state, impact, and response". By this approach, it is possible to measure the effectiveness of applied precautions, in other words, it is possible to explain entity relationship between the driving forces and impacts;

D

Driving force indicators: These indicators are the factors behind various variables. If we need to express in general, all economic activities are classified in this group.

P

Pressure indicators: They define environmental variables that may cause problems. These indicators directly focus on the sources of the problems. In general, all emissions are classified in this group.

S

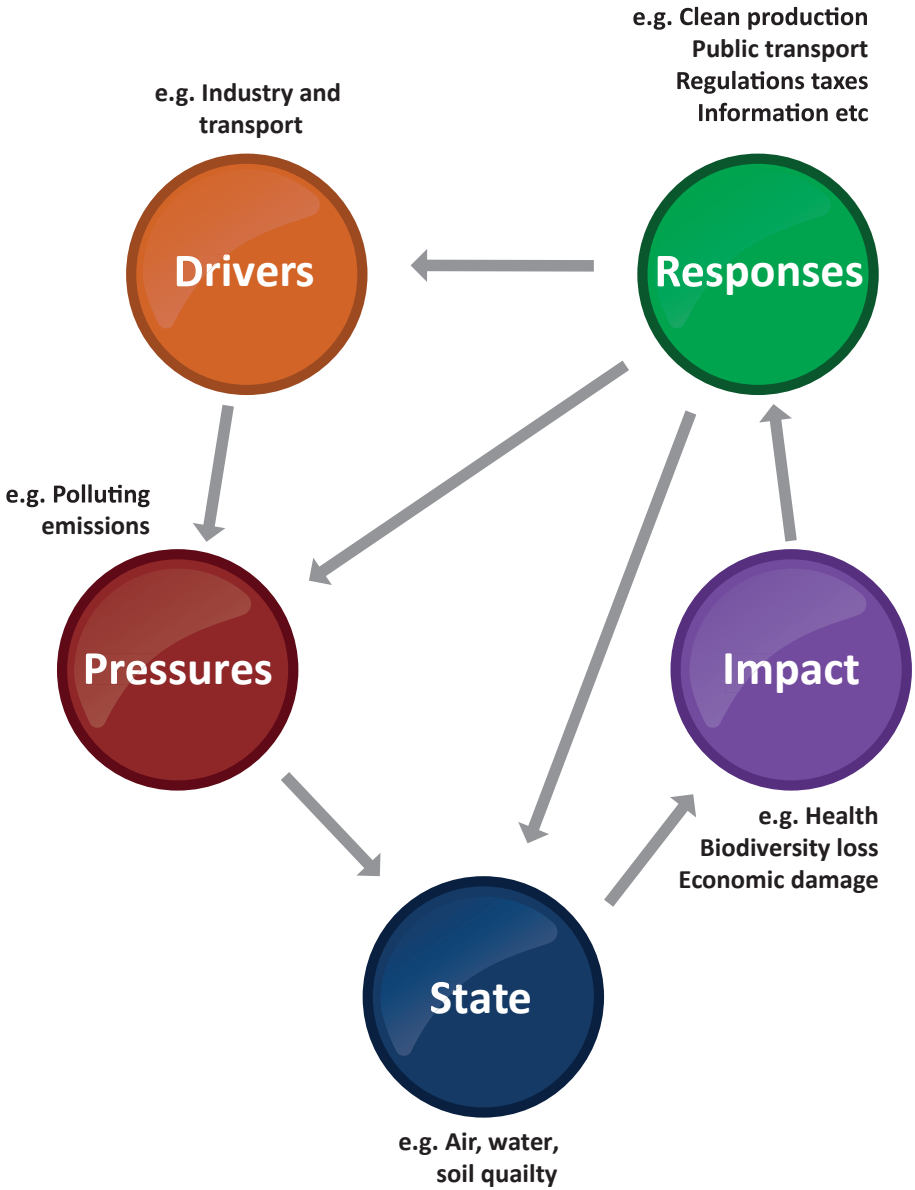
State indicators: These indicators aim to show the current situation of the environment. In general, all concentration measurements are classified in this group.

I

Impact indicators: These are the most extreme effects caused by environmental changes. In general, indicators related to health problems resulted from environmental changes are classified in this group.

R

Response indicators: Response indicators include official attempts to prevent, compensate, and enhance reactions given by individuals or the society against any changes in the situation of the environment or to adapt to these changes. In other words, indicators about the solutions to prevent environmental pollution fall into this category.


e.g. Clean production
Public transport
Regulations taxes
Information etc
e.g. Industry and
transport
Drivers
Responses
e.g. Polluting
emissions
Pressures
Impact
e.g. Health
Biodiversity loss
Economic damage
State
e.g. Air, water,
soil quailty

Indicators of the booklet are classified as follows;

Driving Force Indicators	Pressure Indicators	State Indicators	Impact Indicators	Response Indicators
• Population Growth Rate • Urban Population • Migrant Population • Consumption of Ozone-Depleting Substances (ODS) • Amount of Passengers and Freight by Transport Types • Average Age of Vehicles Registered to the Traffic • Final Energy Consumption by Mode of Transport • Fuel Consumption by Mode of Transport • Primary Energy Consumption by Sectors • Primary Energy Consumption by Fuel Type • Lignite Consumption by Sectors • Final Energy Consumption by Sectors • Primary Energy Consumption Per Capita • Primary Energy Production • Final Energy Intensity	• Greenhouse Gas Emissions • Total Greenhouse Gas Emissions by Sectors • Air Pollutants Emissions • Use of Freshwater Resources • Abstraction for Municipal Water Supply Networks • Waste Production Quantities • Misuse of Agricultural Land • Invasive Alien Species • Highway - Railway Network • Greenhouse Gases Emissions by Transport Types • Emissions of Air Pollutants by Transport • Number of the Road Motor Vehicles in Use • Number and Area of Mining Facilities According to Their Groups • Chemical Fertilizer Consumption • Pesticide Use • Aquaculture Production • Fishing Fleet Capacity • The Number of Tourists • Tourist Overnights and Bed Capacity per 1000 Inhabitants • Technological Accidents	• Life Expectancy at Birth • Sectoral Distribution of Employment • Sectoral Distribution of Gross Domestic Product • Temperature • Average Values of PM10 and SO2 in Ambient Air • Number of Exceedance of Air Quality Limit Value • Oxygen Depleting Substances in Rivers • Nutrients in Freshwater • Bathing Water Quality • General Distribution of Land Cover • Zones Under Threat of Erosion • The Distribution of the Forest Areas • Distribution of Forests by Tree Species • Agricultural Land Per Capita • Blue Flag Implementations • Forest Fires	• Precipitation • Sea Water Temperature • The Number of Endangered Species (Biodiversity) • Natural Disasters	• Environmental Expenditures • Environmental Employment • Carbon Sinks and Capture • The Number of Air Quality Monitoring Stations • Municipalities Served by Wastewater Treatment Unit • Repayment of Energy Incentives for Wastewater Treatment Plant • Municipalities Served by Sewerage Systems • Municipal Waste Disposal • Waste Disposal and Recycling • Protected Areas for Biodiversity • Wildlife Protection Activities • Regulation and Control of the trade of Wild Animals According to the International Conventions • Forest Establishment Activities • Share of Renewable Energy Sources in Gross Final Energy Consumption • Share of Renewable Electricity in Gross Electricity Production • Primary Energy Intensity • Energy Efficiency in Buildings • Number and Area of Abandoned Licenced Mining Facilities • The Number of Laboratories Operating within Environmental Legislation • Environmental Impact Assessment Decisions • Area Under Organic Farming • Good Agricultural Practices • The Number of Environment-Friendly Accommodation Facilities • Number of Risk Assessment and Emergency Response Plans

INDICATORS SUMMARY TABLE

TREND OVER THE PREVIOUS YEAR IN TERMS OF ENVIRONMENTAL IMPROVEMENTS

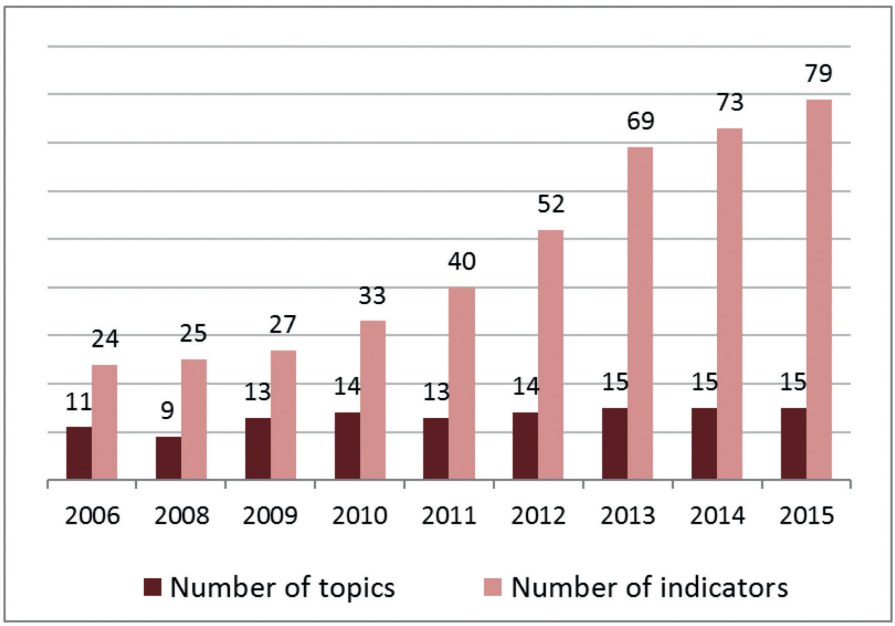
Keys

↑	ADVERSE GROWING TREND	↑	POSITIVE GROWING TREND	→	NEUTRAL DEVELOPMENTS
↓	ADVERSE DECREASING TREND	↓	POSITIVE DECREASING TREND	X	COMPARATIVE DATA NOT FOUND

POPULATION	
Population	↑
Population Growth Rate	↑
Urban Population	↑
Migrant Population	↑
Life Expectancy at Birth	↑
ECONOMY	
Environmental Expenditures	↑
Share of Total Environmental Expenditures in GDP (%)	↑
Environmental Employment	↑
Share of Agriculture in Employment	→
CLIMATE CHANGE	
Greenhouse Gas Emissions	↑
Carbon Sinks and Capture	↑
Consumption of Ozone-Depleting Substances (ODS)	↓
Precipitation	↓
Temperature	↓
Sea Water Temperature	↓
AIR POLLUTION	
SO_2, NO_X, PM_{10} Emissions	↑
NMVOC, NH_3, CO Emissions	↓
Number of Exceedance of Air Quality Limit Value	↑
The Number of Air Quality Monitoring Stations	↑
WATER – WASTEWATER	
Use of Freshwater Resources	↓
Oxygen Depleting Substances in Kucuk Menderes and Ergene Basin	↑
Oxygen Depleting Substances in North Aegean (Bakircay) and Gediz Basins	↓
Nitrate Nitrogen in Ergene Basin	↓
Nitrate Nitrogen in North Aegean (Bakircay), Gediz and Kucuk Menderes Basins	↑
A Class Bathing Water Quality Rate	↑
Water Abstracted for Municipal Water Supply	↑
Rate of Number of Municipalities Served by Wastewater Treatment Plants to the Total Number of Municipalities	↑
Rate of Population Served by Wastewater Treatment Plants	→
Energy Incentive Payments for Wastewater Treatment Plants	↑
Rate of Number of Municipalities Served by Sewerage System to Total Number of Municipalities	↑
Rate of Population Served by Sewerage Systems in Total Municipal Population	↓
Average Amount of Wastewater Discharged Per Capita Per Day	↓
WASTE	
Rate of Collected Household Waste Sent to the Landfills	↑
Number of Landfills	↑
The Ratio of the Population Covered by Landfill to Municipality Population	↑
Recovery Rate of the Hazardous Waste	↑
Percentage of the number of End of Life Vehicles to Total Number of Motor Vehicles in Traffic	↓
Amount of Mining Waste	↓
Amount of Waste Packaging Recovery	↓
The Number of the Licensed Waste Receiving Facilities that Serve for Receiving Wastes from the Vessels in the Ports	↑

LAND USE	
Artificial Areas	↑
Agricultural Areas	↓
Forest and Semi-Natural Areas	↓
Wetlands	→
Misuse of Agricultural Areas	↑
Zones Under Threat of Erosion	X
BIODIVERSITY	
Total Number of Species, Endangered Species, Endemism Rate	X
Number of Invasive Alien Species	↑
Designated Protected Areas	↑
Protected Coastal Zones	↑
Wildlife Protection Activities	↑
Forested Areas	↑
Forest Establishment Activities	↓
INFRASTRUCTURE AND TRANSPORTATION	
Highway Network	↑
Railway Network	↑
Transportation of Passenger on Road (passen-ger-km)	→
Transportation of Freight on Road (tonnes-km)	→
Transportation of Passenger on Railway (pas-senger-km)	→
Transportation of Freight on Railway (tonnes-km)	↓
Greenhouse Gases Emissions by Transport Types	↑
Emissions of Air Pollutants by Transport	→
Number of Motor Vehicles	↑
Average Age of Vehicles Registered to the Traffic	↑
Final Energy Consumption by Mode of Trans-port	↑
ENERGY	
Total Primary Energy Consumption	↑
The Rate of Coal and Its Derivatives in Primary Energy Consumption	↓
Total Final Energy Consumption	↑
Primary Energy Consumption per Person	↑
Primary Energy Production	→
Share of Renewable Energy Sources in Gross Final Energy Consumption	↑
Share of Renewable Electricity in Gross Elec-tricity Production	↑
Primary Energy Intensity	↑
Final Energy Intensity	↓
Energy Efficiency in Buildings	↑
INDUSRY AND MINING	
Yearly Number of Issued Mining Licenses	↓
The Number of Laboratories Operating within Environmental Legislation	↑
AGRICULTURE	
Agricultural Land Per Capita	↓
Chemical Fertilizer Consumption	↑
Pesticide Use	↓
The Ratio of The Organic Agricultural Areas to the Total Agricultural Areas	→
Production Areas to the Total Good Agricultural Practices	↑
FISHERY	
Sea Fishery	↑
Aquaculture Products	↑
Number of Fishing Vessel	↑
Fishing Fleet Total Engine Power	↓
TOURISM	
The Number of Tourists	↓
The Number of Environment-Friendly Accom-modation Facilities	↑
Tourist Overnights and Bed Cbookapacity per 1000 Inhabitants	↑
Blue Flag Implementations	↑
DISASTERS	
Number of Forest Fires and Amount of Burnt Area	↑
Number of Coastal Facility Emergency Plans Approved	↑

The main purpose of the Environmental Indicators Booklet is to represent the relationship between the environment and the sectors and to monitor the activities that have environmental impacts in a sequence and to monitor the results of the applied environmental policies. Moreover, it also aims to provide assist in determining plans, programs and policies, preparing legislations and provide information. Booklets have been developed and become more detailed since the very first booklet "Environmental Indicators 2006" consisting of 11 headings and 24 indicators was published. "Environmental Indicators 2015" is prepared to contain 15 headings and 79 indicators.



According to the booklet "Environmental Indicators 2015";

Population

The total population of Turkey was 78,741,053 in 2015. Turkey was the world's 18th most populous country in 2015. The population growth rate of Turkey, which was 1.33% in 2014, increased to 1.34% in 2015. Population in Turkey is increasing while average age is getting older. After 2050, the population will start to decline. The rank of Turkey will change as 24th in 2075. Rate of people living in towns were 92.1% in 2015; a vast majority living in urban areas with a rapid urbanisation causing increasing pressure on the environment.

Economy

In Turkey, services sector receives the highest share of employees with 52%; in more developed countries employment share of services sector is about 70-80%.

Climate Change

Total greenhouse gas emissions (Equivalent to CO2,) increased in 2014 by 125% compared to 1990, and 6.5% compared to 2013, in Turkey. The biggest cause of the emission increase since 1990 seems to be the rapid increase in energy consumption due to the high economic and industrial development rate after 1990. Turkey's total primary energy consumption is 129,106 thousand TOE's (Tonnes of Oil Equivalent) in 2015 with an increase of 145.1% compared to 1990. Despite the increase, per capita primary energy consumption (1.64 TOE in 2015) in Turkey is still lower than average of European Union Countries (3.2 TOE in 2013).

Parallel to the energy consumption, per capita CO2 equivalent greenhouse gas emissions are estimated as 3.77 ton/ca. in 1990, 5.77 ton/ca. in 2013 and 6.08 ton/ca. in 2014 [11]. CO2 equivalent EU-28 emission per person was calculated as 8.72 tonnes in 2014 [13].Turkey's per capita CO2 equivalent emissions are still lower than the average of the EU Member States. Looking at the sectoral distribution of greenhouse gas emissions, in 2014, when greenhouse gas emissions was taken into consideration as CO2 equivalent, energy-based emissions constitutes the biggest share with (72.5%), and it was followed by industrial processes and product use (13.4%), agricultural activities (10.6%) and waste (3.5%) respectively [11].

Energy

Use of renewable energy sources is important because of their lower carbon intensity (lower CO2 emissions per unit energy). In Turkey, while contribution of renewables to total energy consumption was 18.3% in 1990, in parallel with increasing energy demand, this figure decreased to almost 11.9% in 2015.
Another important issue regarding the environment in energy consumption is energy efficiency. As compared with the year 2000, there is an improvement of 9.7% in the primary energy intensity index and 14.7% in the final energy intensity index in 2014 [58].

Air Quality

For the 120 stations that were in operation since 2009, exceedances for PM10 and SO2 increased respectively by 39% and 15% in 2015 compared to 2014. Particularly in winter months pollutants rising from domestic heating cause significant air pollution problems. Besides present studies, it's thought that additional efforts are required in order to improve air quality.

Water- wastewater

According to the data, water quality of rivers in the basins of Ergene, Kucuk Menderes, Gediz, North Aegean, Sakarya and Susurluk are in class IV (highly polluted water). This does not conclude for all-over Turkey, since monitoring studies were done in the most polluted basins with the most intensive population and industry activity, and the data does not represent whole country.

Compared to 2014, in 2015 biochemical oxygen demand (BOD) decreased in Gediz and Bakırçay basin, however increased in Ergene and Kucuk Menderes basins.

The water exploitation index of Turkey is 21.3% for 2010, 23.9% for 2012 and 21.6% for 2014. The warning threshold of 20% for this indicator distinguishes a non-stressed from a water scarce region, with severe scarcity occurring where the water exploitation index (WEI) exceeds 40% [21].

Rate of Class A (very good) bathing waters increased from 77% in 2014 to 78.6% in 2015.

As a result of studies for environmental protection and financial and technical assistance given by the Ministry of Environment and Urbanisation, the number of municipalities and population serviced by sewerage system and waste water treatment plant increased significantly in recent years. The ratio of population serviced by wastewater treatment plants to the total municipality population reached to 68% by year 2014 [25]. However, with reference to the data presented by TURKSTAT, the population rate connected to at least secondary (biological) wastewater treatment plant was 41.96% in 2012.

Waste

Regarding the waste management principles; the Waste should be reduced at source, then recovery, energy recovery and finally disposal methods should be applied.

According to TURKSTAT data, rate of population served by waste disposal and recovery facilities in total municipal population is 65% in 2014.

Depending on the Hazardous Waste Declaration System (TABS) data, amount of processed hazardous waste in Turkey in 2015 is calculated to be 1,357,340 tonnes (excluding waste from the mining sector). Of the processed total, 83.2% was diverted to recovery, 12.3% was disposed off, 3.9% stored and 0.6% was exported.

Land use

According to CORINE (Coordination of Information on the Environment) datas, in Turkey between 1990 and 2012, while forests and semi-natural areas decreased by 1,212,900 ha, all other areas have increased, such as artificial surfaces by 424,867 ha, agricultural areas by 423,756 ha, water bodies by 173,305 ha and wetlands by 159,604 ha. Increasing population, urbanisation and industrialization posed threat to natural and agricultural areas.
Turkey's geographical position, climate, topography and soil conditions are the main factors which affect the deterioration of the land and increase the sensitivity of drought. There are various erosion types observed all over the country; while water erosion is the most widespread one. 61.2% of the territory of the country faces high level (severe and very severe) water erosion problem.

Biodiversity

Turkey is a gene centre for several plant species. The country has a special position as for biological diversity, however, some plant and animal species are endangered and a number of species that existed before, has already been extinct.
The endemism rate is about 34%, in Turkey. Turkey is very rich country in terms of endemic plants; however, these endemic species are under serious threats. According to the criteria of IUCN, 2001, approximately 600 of our endemic species are in the category of "seriously endangered CR" and 700 of them are categorised as "endangered EN". Among wild animals, 121 mammals, 378 birds and 130 reptiles, in total 629 species have been under protection.
While the number of invasive alien species in Turkish seas was 263 in 2005, this number increased to 422 in 2011 and approached to 475 in 2015. In inland water bodies 25 invasive alien species have been identified [36]. While most of the invasive species in the Mediterranean come through the Suez Canal, most of those in Black Sea are transported to the Black Sea via the ballast waters of vessels [38].
As for 2015, ratio of total protected areas (including areas protected by Ministry of Forestry and Water Affairs and by the Directorate General for Preservation

of Natural Heritage under the Ministry of Environment and Urbanisation) to the total surface area of the country was 8.9%, This is below the World average which was 12.8% in 2014 [41].
In 2015, total size of forests in Turkey was 22,342,935 hectares which constitutes 28.6% of the country's total surface area. However, 43% of this area constitutes of degraded and either lightly covered or not covered areas.
The majority of the forest fires are caused by people. The reasons of the 45% of forest fires in 2015 could not be specified. 37% were caused by carelessness-accidents, 12% by natural causes (lightning), it was concluded that 6% of the fires were started intentionally.

Infrastructure and transportation

Compared to roads, railways release less greenhouse gas to the atmosphere as they consume energy more efficiently. In addition, less land is used for the construction of railways, thus this plays a significant role in the preservation of the natural environment. In 2014, almost 89% of domestic passenger and freight transport is done by land roads in Turkey.

Agriculture

Fertilizer consumption was about 92.2 kg per hectare active substance (plant nutrient basis) in 2015. According to World Bank's 2013 data, average fertilizer use of EU-27 countries for per hectare was 179.85 kg/hectares. In the individual regions of Turkey and second and third agricultural product grown area there have been observed extreme fertilizer use. In 2015, 39,026,438 kg/lt pesticides were used in Turkey. This amount is targeted to be limited at about 40 thousand tonnes [61].
Fisheries
It is known that neither in the world nor in Turkey the amount obtained by catching will not increase significantly. For this reason, the basic approach accepted by scientists in hunting is to maintain production while preserving stocks [64]. The size of the fishing fleet has been limited by denying licenses for new vessels since 2002.

Tourism

Turkey is one of the leading countries in tourism, regarding the number of visiting tourists and tourism income. The number of tourists in 2015 compared

to 2014 decreased by 0.84%. However, number of tourists visiting a particular location exert a pressure on the local environment due to land use, water consumption, waste and waste water generation and noise.
This requires higher concern and more measures on environmental issues in touristic areas.
As a response in 2015, 294 of 3319 (%8.9) tourism accommodation facilities have been issued "Environment friendly accommodation facility" certificate (Green Star). Moreover, with 436 beaches that possess Blue Flag, Turkey is ranked second place following Spain ; with 22 marinas ranked 7th place in the World.
This situation necessitates more measures in enviroınmental issues in touristic areas.

Conclusions

Environmental problems are not only resulted from production processes, but they are also related with our life styles and our consumption habits. These habits which form our life style have a significant importance on environmental impacts. Accordingly, the increase in consuming environmentally-friendly products and improving the awareness about the effects of our consumption habits on environment will decrease the pressure in this subject.
Besides applying the policies legislated by law, environmental problems can also be reduced by using technological approaches in production, changing our consumption habits, and focusing on more environmentally friendly means and methods especially in transportation, energy and agriculture sectors.
In this regard, information management and use of environmental indicators are crucial in policy making, target setting and progress monitoring.

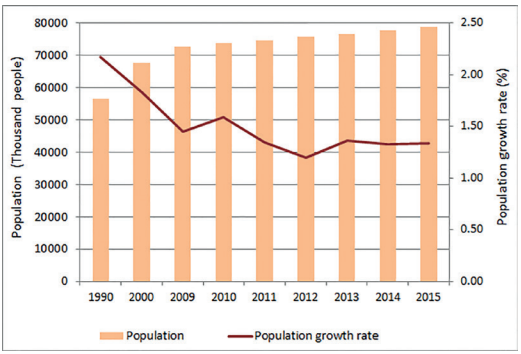
1.1- Population Growth Rate

Population growth rate is the most significant driving force among human activities that create impact on the environment.

Although the population growth rate in Turkey had a declining trend in time, Turkey's population has continued to increase constantly. While the population growth rate was 1.33% in 2014, it increased to 1.34% in 2015. In 2015, the population of Turkey became 78 million 741 thousand 53 people. The population density which is the number of persons per square kilometre increased by 1 person compared to 2014 and reached to 102 in 2015. The median age of the population in Turkey increased from 30.7 in 2014 to 31.0 in 2015 [2].

The world population in 2015 was more than 7 billion according to the population projections calculated by United Nations. Constituting 1.1% of the world population, Turkey was the world's 18th most populous country.

GRAPH 1- POPULATION AND POPULATION GROWTH RATE CHANGES OVER THE YEARS



Source: TURKSTAT Population Censuses, 1990-2000 and Address Based Population Registration System (ABPRS), 2009-2015

Note: In the calculation of annual growth rate of population, latest year's administrative division was taken into consideration.

TABLE 1- POPULATION AND POPULATION GROWTH RATE CHANGES OVER THE YEARS

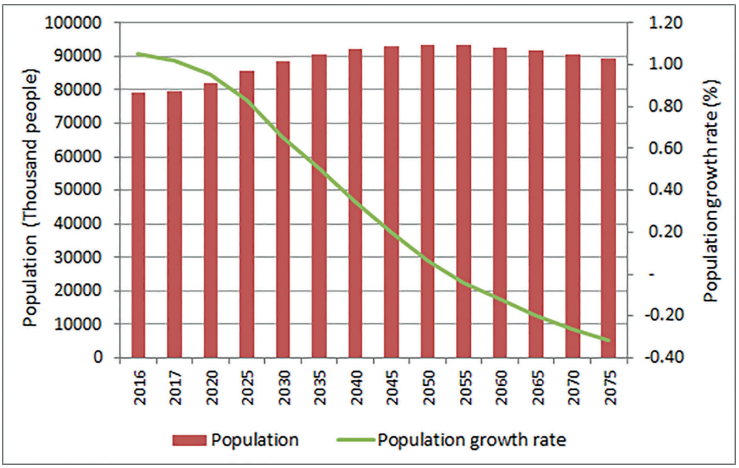
YEARS	1990	2000	2009	2010	2011	2012	2013	2014	2015
Population (1000 people)	56,473	67,804	72,561	73,723	74,724	75,627	76,668	77,696	78,741
Population Growth Rate(%)	2.17	1.83	1.45	1.59	1.35	1.20	1.37	1.33	1.34
Population density (persons/km²)	73	88	94	96	97	98	100	101	102

Population projections are very important for future policy-making. Determination of current population trends and predicting future population structure according to these trends provide making healthier policies.

The population of Turkey will be 82,076,788 in 2020. This population will increase slowly to the year 2050, and it will reach to its highest value with 93,475,575 people in this year. After 2050, the population will start to decline, and it is expected to be 89,172,088 in 2075.

In 2075, world population size will increase to 9 billions and 905 millions people. The rank of Turkey will change as 24 [3].

GRAPH 2- POPULATION PROJECTIONS BY YEARS, 2016-2075



Source: TURKSTAT, Population Projections, 2013-2075

TABLE 2- POPULATION PROJECTIONS BY YEARS, 2016-2075

YEARS	2016	2017	2020	2025	2030	2035	2040
Population (1000 people)	78,966	79,766	82,077	85,569	88,428	90,680	92,258
Population Growth Rate (%)	1.05	1.02	0.95	0.83	0.66	0.50	0.34
Population density (persons/km²)	103	104	107	111	115	118	120

YEARS	2045	2050	2055	2060	2065	2070	2075
Population (1000 people)	93,175	93,476	93,278	92,717	91,800	90,589	89,172
Population Growth Rate (%)	0.20	0.06	- 0.04	- 0.12	- 0.20	- 0.27	- 0.3
Population density (persons/km²)	121	121	121	120	119	118	116

1.2- Urban- Rural Population Ratio

D P S I R

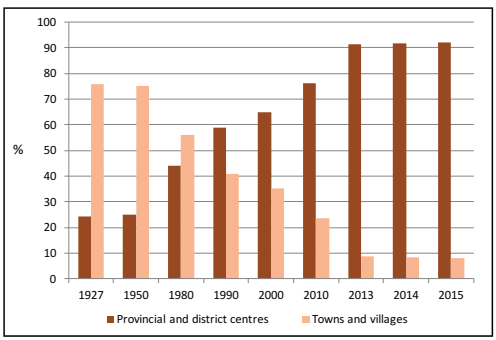
Urban population appears to be a driving force leading to pressure on environmental assets.

Rapid growth of urban population, correspondingly brings about an increase in urban expansion, infrastructure, transportation, housing, industrial area, and energy needs, which in the end leads to environmental problems such as air pollution, wastewater and noise. Urbanisation is one of the most important processes which are experienced parallel to industrialization and economic development.

According to the first census conducted in 1927 In Turkey, population was 13,648,270, and 75.8% of the people lived in towns and villages and 24.2% in cities; however, after 1950 population started to agglomerate in urban areas.

According to the results of Address Based Population Registration System in 2015, population residing in province and district centres was 72,523,134 people and population residing in towns and villages was 6,217,919 people. In 2013, new metropolitan municipalities were established in 14 provinces. Towns and villages were affiliated to these municipalities as districts in 30 provinces with metropolitan status. This had a significant influence on the increase of urbanisation rate to 91.8% in 2014 and to 92.1% in 2015. Proportion of population living in small towns and villages was 8.2% in 2014 and was 7.9% in 2015 [2].

GRAPH 3- URBAN AND RURAL POPULATION RATES THROUGH THE YEARS



Source: TURKSTAT
NOTE: The results of population cencuses were used for the years between 1927 and 2000 while the results of address based population registration system were used for the years between 2010 and 2015.

About half of the global population lives in urban areas, and this share is projected to increase to two thirds by 2050. Nearly 73% of the European population lives in cities [4], [5], [6].

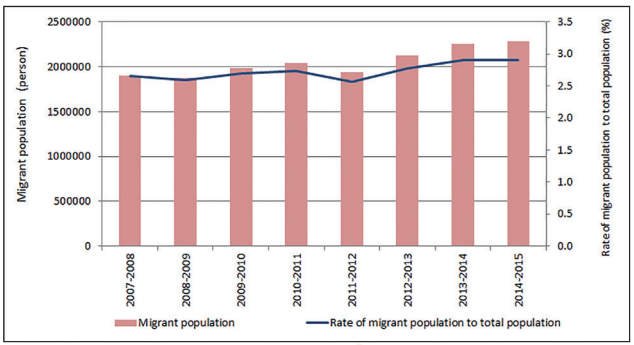
1.3- Migrant Population

Internal migration is defined as changes in usual residence addresses of population within one year in the specific areas inside the country. Conditions which are forced by economic development before demographic movements such as rapid population growth and migration from country to town is in question.

According to the results of Address Based Population Registration System, migrant population was 2,122,454 during the 2012-2013 period while it was 1,903,234 during the 2007-2008 period. Migrant population has increased every year and it became 2,287,542 for the 2014-2015 period.

Provinces that have the highest net migration (the difference between immigration and emmigration) during 2014-2015 period are; Ankara (51,047 people), İstanbul (50,543 people), and Kocaeli (30,231 people), and the lowest net migration are; Diyarbakır (-19,901 people), Van (-17,569 people), Ağrı (-15,577 people). [7]

GRAPH 4- MIGRANT POPULATION, 2008-2015



Source: TURKSTAT, The results of Address Based Population Registration System (ABPRS), 2008-2015
Foreign population is not included.

TABLE 3- MIGRANT POPULATION, 2008-2015

Period	2007-2008	2008-2009	2009-2010	2010-2011
Total Population	71,517,100	72,561,312	73,722,988	74,724,269
Migrant Population	1,903,234	1,876,673	1,985,917	2,045,720
Rate of Migrant Population to Total Population (%)	2.7	2.6	2.7	2.7

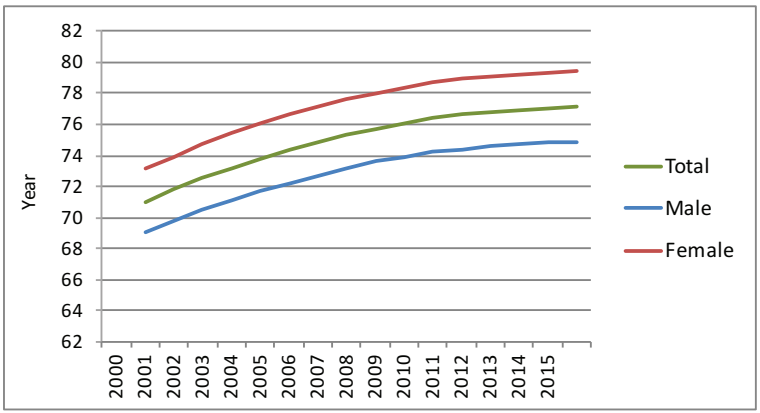
Period	2011-2012	2012-2013	2013-2014	2014-2015
Total Population	75,627,384	76,667,864	77,695,904	78,741,053
Migrant Population	1,942,874	2,122,454	2,254,607	2,287,542
Rate of Migrant Population to Total Population (%)	2.6	2.8	2.9	2.9

1.4- Life Expectancy at Birth

Life expectancy at birth is used to measure status of the socio-economic development, quality of life and the levels of mortality for countries. According to TURKSTAT datas, life expectancy at birth was 71 years in 2000. It became 77 years in 2015.

According to estimations for the year of 2015, life expectancies at birth is 68.7 years in the world. Countries with the highest life expectancy at birth are Monaco (90 years), Japan (85 years), Singapore (85 years), Iceland-Hong Kong-Switzerland (83 years). In line with TURKSTAT's estimations and projections, Turkey ranks as the 71th among 222 countries with the 77.1 years of life expectancy at birth in 2015 [8].

GRAPH 5- LIFE EXPECTANCY AT BIRTH



Source: *TURKSTAT*
Notes: *1. Demographic indicatos are generated by updated 2000-2006 Population Estimates, 2007-2012 Results of Address Based Population Registration System, Birth Statistics, Death Statistics and 2013-2075 Population Projections.*

TABLE 4- LIFE EXPECTANCY AT BIRTH (YEAR)

Year	2000	2001	2002	2003	2004	2005	2006	2007
Total	71.0	71.8	72.5	73.2	73.8	74.4	74.9	75.3
Male	69.0	69.8	70.5	71.1	71.7	72.2	72.7	73.2
Female	73.1	73.9	74.7	75.4	76.0	76.6	77.1	77.6

Year	2008	2009	2010	2011	2012	2013	2014	2015
Total	75.7	76.1	76.4	76.6	76.8	76.9	77.0	77.1
Male	73.6	73.9	74.2	74.4	74.6	74.7	74.8	74.9
Female	78.0	78.4	78.7	78.9	79.1	79.2	79.3	79.4

2.1- Environmental Expenditures

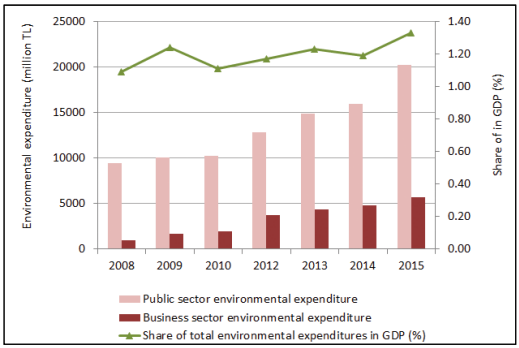
D P S I R

The environmental performances of the countries are directly related with their economies. Environmental expenditures appear as a response indicator for the protection of the environment.

In 2015, total environmental expenditure was 25.9 billion TL, of which 67.6% was current expenditure and 32.4% was investment expenditure. Share of total environmental expenditures in gross domestic product was 1.3% in 2015.

In total environmental expenditure, waste management services accounted for 38.7%, water services accounted for 34%, wastewater management services accounted for 18.4% and others accounted for 8.9% in 2015 [9].

GRAPH 6- ENVIRONMENTAL EXPENDITURES



Source: TURKSTAT

TABLE 5- ENVIRONMENTAL EXPENDITURES BY SECTOR

YEARS	2008	2009	2010	2012	2013	2014	2015
Total (million TL)	**10,356**	**11,803**	**12,206**	**16,582**	**19,275**	**20,732**	**25,935**
Public Sector Environmental Expenditures (million TL)	**9,416**	**10,078**	**10,241**	**12,848**	**14,914**	**15,935**	**20,249**
Governmental organisations and private provincial administrations (million TL)	1,280	1,335	1,479	2,190	2,426	2,197	2,419
Municipalities (million TL)	7,763	8,377	8,377	10,237	11,929	13,431	17,428
Local administrations unions (million TL)	374	366	385	421	559	307	402
Business Sector Environmental Expenditures (million TL)	**940**	**1,725**	**1,965**	**3,734**	**4,361**	**4,797**	**5,686**
Enterprises (million TL)	872	1,498	1,834	3,527	4,067	4,431	5,310
Organized industrial zones (million TL)	68	227	131	207	294	366	377
Share of Total Environmental Expenditures in GDP (%)	1.09	1.24	1.11	1.17	1.23	1.19	1.33

Source: TURKSTAT

2.2- Environmental Employment

Environmental employment is the number of personnel working in public institutions and private sectors related to environmental operations. The number of personnel working related to environmental operations is necessary to be enough in order to protect and inspect environment, and remove pollution.

Environmental employment was 80 thousand 827 employees in 2015. 8% of this total are employed in public sector and 92% in private sector. Among the total number of people in the private sector, 98.5% are employed in enterprises and 1.5% in organized industrial zones. People working on water supply, sewerage, waste management and remediation acitivites form 64% of the employment in enterprises.

GRAPH 7- ENVIRONMENTAL EMPLOYMENT BY SECTOR

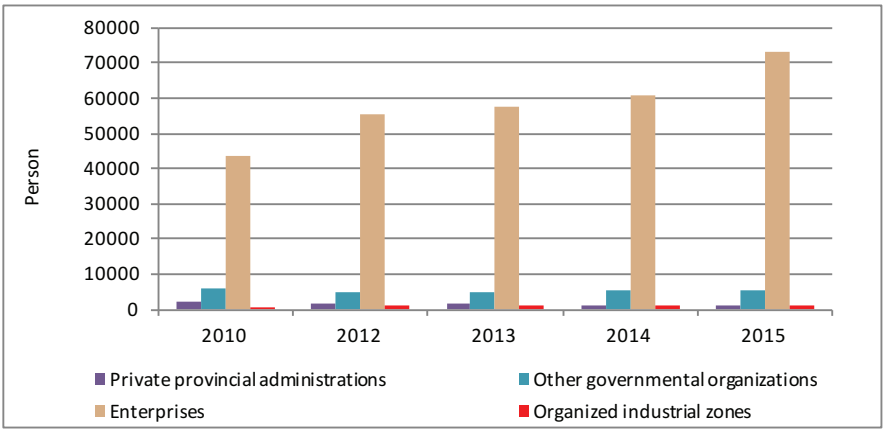


TABLE 6- ENVIRONMENTAL EMPLOYMENT BY SECTOR

YEARS	2010	2012	2013	2014	2015
Total	**52,457**	**63,331**	**65,124**	**68,486**	**80,827**
Public Sector (1)	**8,298**	**6,921**	**6,799**	**6,447**	**6,445**
Private Provincial Administrations	2,305	1,855	1,847	1,003	1,073
Other Govermental Organisations (2)	5,993	5,066	4,952	5,444	5,372
Business Sector	**44,159**	**56,410**	**58,325**	**62,039**	**74,382**
Enterprises	43,583	55,564	57,393	61,068	73,257
Organized Industrial Zones	576	846	932	971	1,125

Source: TURKSTAT
(1) Excluding environmental employment in municipalities and local administration unions.
(2) It covers ministries and affiliated institutions.

2.3- Sectoral Distribution of Employment

D P S I R

This indicator is a status indicator. Distribution of the working population of a country among sectors has an enormous effect on the quality and size of the pressure of the population on the environment.

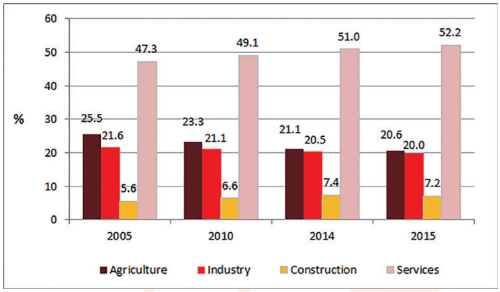
Due to the inevitable result of development, there is a decrease in employment in agriculture, where as an increase in industry and mostly in service sectors. Over the years in Turkey, there has been a decrease in the number of people employed in agriculture while employment in service sector has been increasing. In 2015, while the rate of employment in the service sector was 73% in EU 19 average, this rate was still 52.2 % in Turkey.

In 2015, considering sectoral distribution of employment, the rates in EU-19 countries were 3.3% in agriculture, 17.1% in industry, 6.5% in construction, 73.2% in services. The rates in OECD countries are 4.7% in agriculture, 15.8% in industry, 6.4% in construction, 73.1% in services [10].

TABLE 7- SECTORAL DISTRIBUTION OF EMPLOYMENT

YEARS	2005		2010		2014		2015	
	Thousand person (+15 age)	%	Thousand person (+15 age)	%	Thousand person (+15 age)	%	Thousand person (+15 age)	%
TOPLAM	19,633	100.0	21,858	100.0	25,933	100.0	26,621	100.0
Agriculture	5,014	25.5	5,084	23.3	5,470	21.1	5,483	20.6
Industry	4,241	21.6	4,615	21.1	5,316	20.5	5,332	20.0
Cosntrustion	1,097	5.6	1,434	6.6	1,912	7.4	1,914	7.2
Services	9,281	47.3	10,725	49.1	13,235	51.0	13,891	52.2

GRAPH 8- SECTORAL DISTRIBUTION OF EMPLOYMENT



Source: TURKSTAT, Labour Force Statistics. (http://www.tuik.gov.tr/UstMenu.do?metod=temelist)

Notes: Total figures may not be exact due to the rounding of the numbers.
The results of 2005-2013 period were estimated by using econometric model.
Classification of Economic Activities NACE Rev-2 was used.

2.4- Sectoral Distribution of Gross Domestic Product

This indicator is a state indicator that shows contribution to GDP by agriculture, industry and services sectors.

The indicator represents as percentage, shares of economic activity branches in the GDP (consumer price index with current prices).

In 2015, gross domestic product has been 1,953,561 million TL at current prices by production approach. With 57.4%, followed by the industrial sector with 23.4%.

Within the 57.4% rate of the services sector; 11,6% was by wholesale and retails, 11.6% by transport and storage, 9.7% by real estate activities and 24.5% was the sum of the other service sector activities.

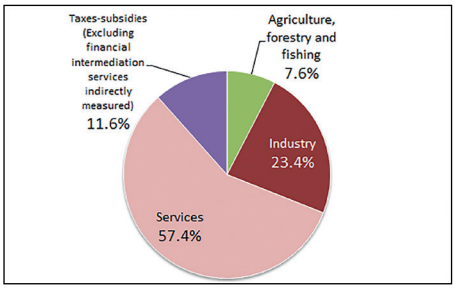
Among 23.4% rate of the industrial sector; 15.6% was by manufacturing industry, 4.4%, by construction activities, 1.4% electricity, gas, steam and air conditioning supply, 1.3% mining and quarrying, 0.7% water supply, sewerage, waste management and remediation activities.

TABLE 8- GROSS DOMESTIC PRODUCT IN CURRENT PRICES - BY KIND OF ECONOMIC ACTIVITY (%)

YEARS	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TOTAL	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Agriculture, forestry and fishing	8.3	7.6	7.6	8.3	8.4	8	7.9	7.4	7.1	7.6
Industry	24.9	24.8	24.5	23.0	23.6	24.4	23.8	23.6	24.1	23.4
Services	55.0	57.0	57.8	59.5	57.2	56.3	57.5	57.6	57.7	57.4
Taxes-subsides (Excluding Financial intermediation services indirectly measured)	11.9	10.5	10.1	9.2	10.8	11.3	10.9	11.4	11.1	11.6

Source: TURKSTAT, Gross Domestic Product Press Releases, http://www.tuik.gov.tr/OncekiHBArama.do
Note: Figures may not sum up to 100 due to rounding.
NACE Rev1.1 used for classification of Economic Activities. Since the end of 2011, classification system has been changed to NACE Rev. 2 and the present series have been updated accordingly.

GRAPH 9- SECTORAL BREAKDOWN OF GROSS DOMESTIC PRODUCT IN CURRENT PRICES IN 2015 (%)



3.1- Greenhouse Gas Emissions

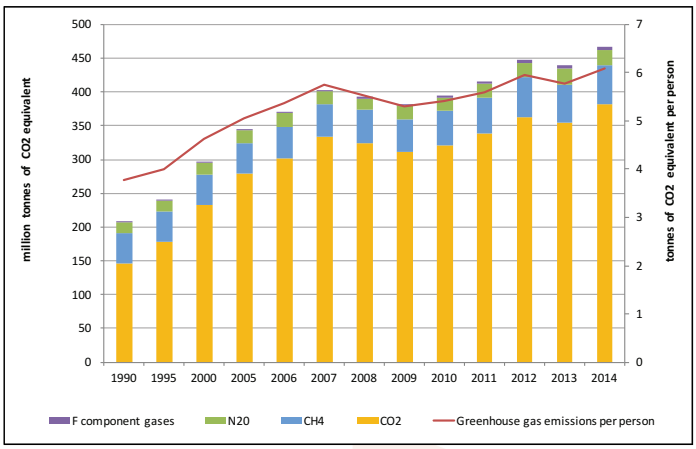
D P S I R

This indicator is a pressure indicator. Greenhouse gas emissions are important with regard to Turkey's contribution to climate change with respect to the source sector distribution and also for monitoring and controlling activities.

Total greenhouse gas emissions (CO2-equivalent,) increased in 2014 by 125% compared to 1990, 6.5% compared to 2013 [11]. In Europe in 2014 greenhouse gas emissions were 24.4% below 1990 levels (excluding land use, changes in land use, emissions caused by forestation and sinks (LULUCF) and international aviation).Greenhouse gas emissions in 2014 amounted to 4286 million tonnes of CO2 equivalent in the EU-28 [12].

CO2 equivalent emission was calculated as 3.77 tonnes per person in 1990's but in 2014, this value went up to 6.08 tonnes per person [11]. CO2 equivalent EU-28 emission per person was calculated as 8.72 tonnes in 2014 [13].

GRAPH 10- GREENHOUSE GAS EMISSIONS TREND OVER THE YEARS



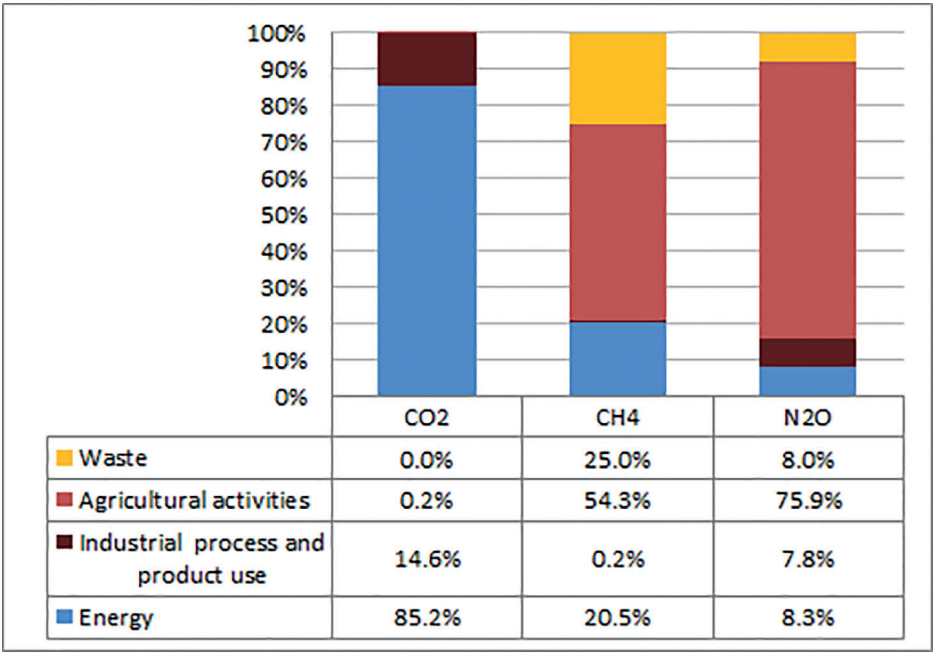
Source: *TURKSTAT*
Notes: *Land usage, land usage changes and forestry sources emissions and sinks are not included.*

TABLE 9- GREENHOUSE GAS EMISSIONS TREND OVER THE YEARS

CO_2 equivalent (million ton)

YEAR	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
CO_2	146.8	178.8	232.5	279.1	302.2	333.2	323.5	310.6	320.4	338.1	363.1	355.0	382.2
CH_4	43.8	43.9	44.8	44.6	46.1	48.5	49.6	49.4	51.4	53.9	58.0	56.2	57.1
N_2O	16.5	15.8	18.4	19.0	20.2	19.1	17.3	19.7	19.6	19.5	21.1	23.2	23.3
F Component Gases	0.7	0.6	1.0	2.5	2.7	2.6	2.7	2.9	3.9	4.3	5.2	4.5	4.9
TOTAL	**207.8**	**239.0**	**296.8**	**345.2**	**371.3**	**403.4**	**393.1**	**382.5**	**395.3**	**415.9**	**447.5**	**438.8**	**467.6**

GRAPH 11- IN 2014, SECTORAL BREAKDOWN OF EMISSIONS OF CO_2, CH_4 and N_2O (%)



	CO2	CH4	N2O
Waste	0.0%	25.0%	8.0%
Agricultural activities	0.2%	54.3%	75.9%
Industrial process and product use	14.6%	0.2%	7.8%
Energy	85.2%	20.5%	8.3%

Source: TURKSTAT

In the second and third sections of the Second National Communication on Climate Change, it is stated that, with regard to greenhouse gas emission per capita, historical responsibility and primary energy consumption per capita, Turkey has the lowest values when compared to the countries in the Annex-1 list of UNFCCC (United Nations Framework Convention on Climate Change) and OECD (Organization for Economic Cooperation and Development). Additionally, with respect to development and industrialization level, Turkey is not as advanced as many other OECD countries and the countries in the Annex-1 list of UNFCCC and some of the countries not stated in the list. Similarly, the amount of emission created by one unit GDP is far below the OECD and world average. On the other hand, the historical contribution (between the years 1850-2000) of Turkey to the cumulative greenhouse gas released to the atmosphere since the industrial revolution has been only 0.04% [14].

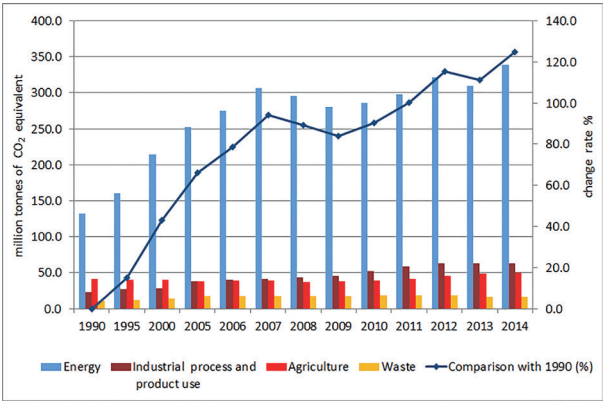
3.2- Total Greenhouse Gas Emissions by Sectors

Looking at the sectoral distribution of greenhouse gas emissions, it is observed that the increase in total emissions is mainly due to energy production and consumption. It is followed by emissions resulted from industrial processes and product use.

While greenhouse gas emissions generatedby energy sector were 132.5 million tonnes CO_2 equivalent in 1990, it increased to 310 million tonnes CO_2 equivalent in 2013. In 2014, these emissions have increased by 9.4% to 339 million tonnes CO_2 equivalent.

In 2014, when greenhouse gas emissions was taken into consideration as CO_2 equivalent, energy-based emissions constitutes the biggest share with (72.5%), and it was followed by industrial processes and product use (13.4%), agricultural activities (10.6%) and waste (3.5%) [11].

GRAPH 12- TOTAL GREENHOUSE GAS EMISSIONS BY SECTORS



Source: TURKSTAT

TABLE 10- TOTAL GREENHOUSE GAS EMISSIONS BY SECTORS

CO2 equivalent (million ton)

YEARS	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Energy	132.5	160.1	214.4	252.7	275.2	306.1	295.3	280.9	286.0	298.2	321.3	310.0	339.1
Industrial Process and Product Use	23.1	27.0	28.4	37.8	39.8	41.1	43.5	45.8	51.8	58.2	62.4	63.2	62.8
Agriculture	41.2	39.8	39.6	37.9	38.9	38.5	36.5	38.0	39.3	41.1	45.8	49.3	49.5
Waste	10.9	12.2	14.4	16.9	17.4	17.7	17.8	17.9	18.1	18.4	18.0	16.2	16.1
Comparison with 1990(%)	-	15.0	42.9	66.2	78.7	94.2	89.2	84.1	90.2	100.2	115.4	111.2	125.0

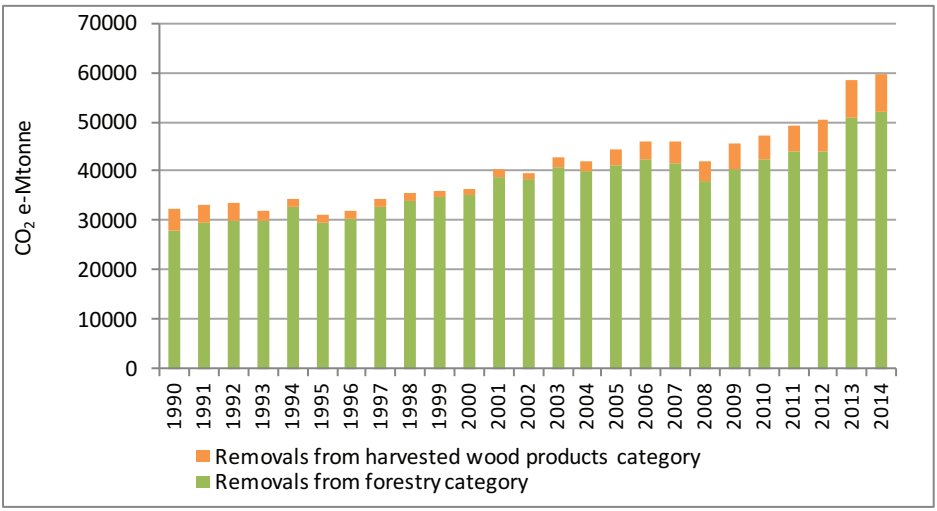
3.3- Carbon Sinks and Capture

D P S I R

The rate of build-up of CO_2 in the atmosphere can be reduced by taking advantage of the fact that atmospheric CO_2 can accumulate as carbon in vegetation and soils in terrestrial ecosystems. Under the United Nations Framework Convention on Climate Change any process, activity or mechanism which removes a greenhouse gas from the atmosphere is referred to as "sink". Human activities impact terrestrial sinks, through land use, land-use change and forestry (LULUCF) activities, consequently, the exchange of CO_2 (carbon cycle) between the terrestrial biosphere system and the atmosphere is altered [15].

The carbon captured by forests and processed forest products has been increased by 84 % between 1990 and 2015 in Turkey.

GRAPH 13- CARBON SINKS IN TURKEY AND ANNUAL CAPTURE (1990-2014)



Source: Ministry of Forestry and Water Affairs, General Directorate of Forestry

TABLE 11-CARBON SINKS IN TURKEY AND ANNUAL CAPTURE

(CO2 e-Mtonne)

Years	1990	1995	2000	2005	2010	2011	2012	2013	2014
Annual Carbon Capture by Foresty	28,118	29,747	35,266	41,111	42,566	43,824	44,070	50,817	51,982
Annual Greenhouse Gas Capture by Harvested Wood	4,368	1,306	1,257	3,164	4,585	5,425	6,400	7,509	7,809
TOPLAM	**32,486**	**31,053**	**36,523**	**44,275**	**47,151**	**49,249**	**50,470**	**58,326**	**59,791**

Source: Ministry of Forestry and Water Affairs, General Directorate of Forestry

3.4- Consumption of Ozone Depleting Substances (ODS)

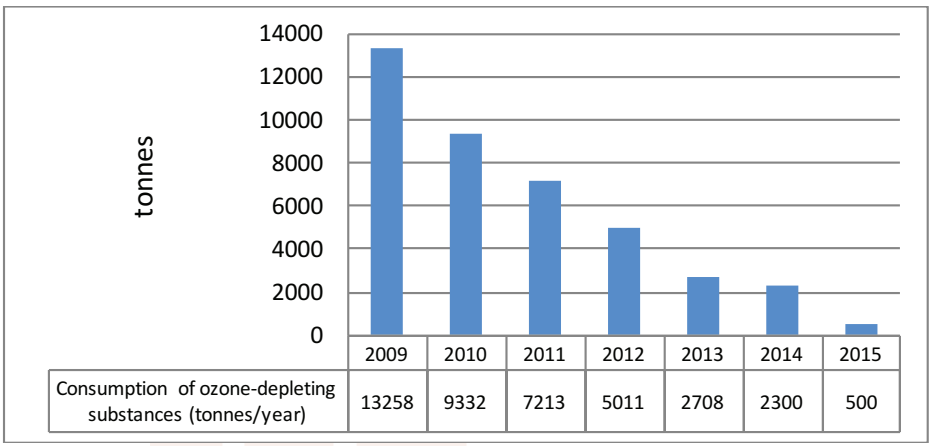
D P S I R

This indicator is a driving force indicator. The release of ozone depleting substances to the atmosphere leads to the depletion of the Earth's ozone layer. The stratospheric ozone layer protects humans and the environment from harmful ultra-violet (UV) radiation emitted by the sun [17].

Consumption of chlorofluorocarbons (CFC) and halons, CFC-11, CFC-12, CFC-113, CFC-114, CFC-115, Carbon Tetrachloride, Methyl Chloroform, Halon 1211, Halon 1301, Halon 2402, HCFC-22 are under this scope.

Turkey has been a party to the Montreal Protocol on Substances that Deplete Ozone Layer in 1991 and is among the developing countries of the Protocol as the A5 country. The import and consumption of ODS's that haven't been produced in our country are gradually terminated in accordance with the Protocol obligations. Projects and public / sector awareness-raising activities are carried out on transition to alternative substances. Our country is making a successful trend by implementing a faster termination calendar than other developing countries. In Turkey, the use of substances that reduce the ozone layer during the period 2009-2015 has decreased by 96.23%.

GRAPH 14- CONSUMPTION OF OZONE DEPLETING SUBSTANCES (ODS)



	2009	2010	2011	2012	2013	2014	2015
Consumption of ozone-depleting substances (tonnes/year)	13258	9332	7213	5011	2708	2300	500

Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management, Climate Change Management Department)

Globally, consumption of ODS controlled under the Montreal Protocol has declined by some 97.64% worldwide in the period 1986-2014.

In the European Environment Agency countries (EU-33) consumption of substances that deplete the ozone layer during the same period has decreased by 100.34% [17].

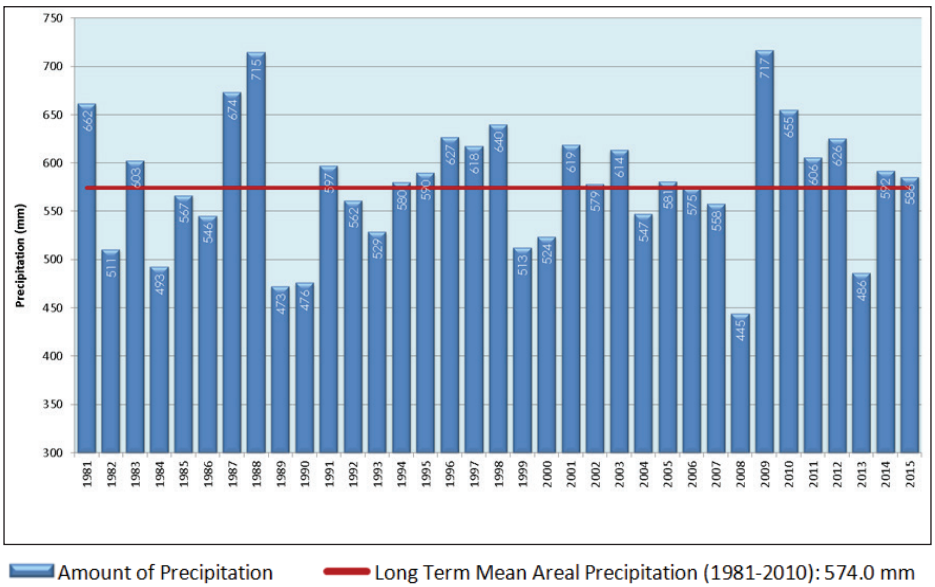
3.5- Precipitation

D P S I R

This impact indicator represents amount of average precipitation on unit area in time series.

The long term annual average precipitation is about 574 mm in our country. 585.7 mm average rainfall was recorded in 2015 (January 1 to December 31). When the rainfall distribution over the years is studied, a rainy period started after a very dry year occurred in 2008. Although the drought was observed again in 2013, rainfall occurred higher than the long term annual average within the last two years in Turkey.

GRAPH 15- ANNUAL MEAN AREAL PRECIPITATION FOR TURKEY



Source: Ministry of Forestry and Water Affairs, Turkish State Meteorological Service

It has been observed that mean areal precipitation in 2015 was 2% higher than the long term annual average, but 1% lower than average in 2014. Regionally, the decrease of 6% and 3% and 3% in mean areal recipitation was observed in Eastern Anatolia, Marmara and South-Eastern Anatolia respectively while Aegean region received precipitation near normal in 2015. The highest increase was in the Aegean region with 10 %.

Regarding to global rainfall has been assessed, global average rainfall in 2015 occurred 22.5mm less than the average of 1961 to 1990 period with 1033 mm precipitation[18].

3.6 - Temperature

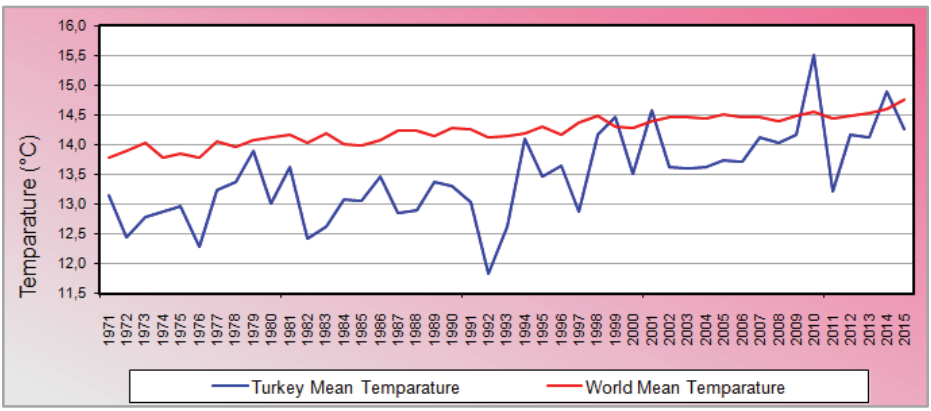
D P S I R

This state indicator represents the change in annual average temperature in time series, globally and in Turkey.

The global combined ocean and surface temperature in 2015 broke all previous records by a strikingly wide margin, at 14.75°C above the 20th century average (13.9°C) (NOAA, 2016). Turkey annual mean temperature in 2015 has been 14.3°C which is 0.8°C above 1981-2010 average (13.5°C). Lowest temperature in 2015 was in January with -28.8°C in Ağrı while highest temperature was in August with 47.4°C in Cizre.

From 1971 to 2015, highest mean temperature in Turkey has been recorded in 2010 as 15.5°C while lowest was in 1992 as 11.8°C. There are positive temperature anomalies in Turkey since 1994 (except 1997 and 2011) [18].

GRAPH 16-ANNUAL MEAN TEMPERATURE IN THE WORLD AND TURKEY



Sources: NOAA, Ministry of Forestry and Water Affairs, Turkish State Meteorological Service

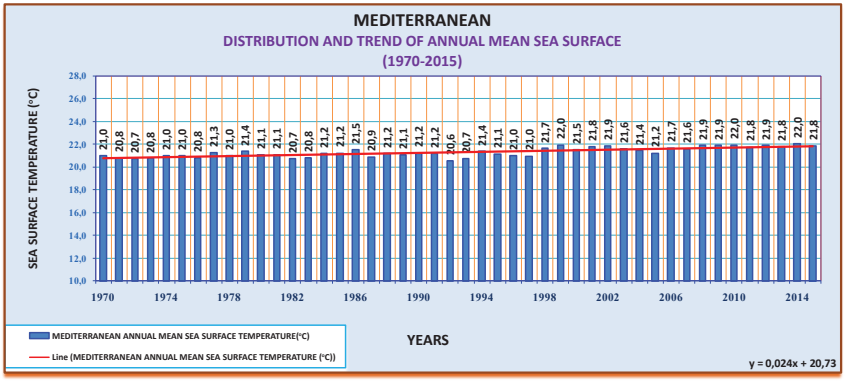
3.7 - Sea Surface Temperature

D P S I R

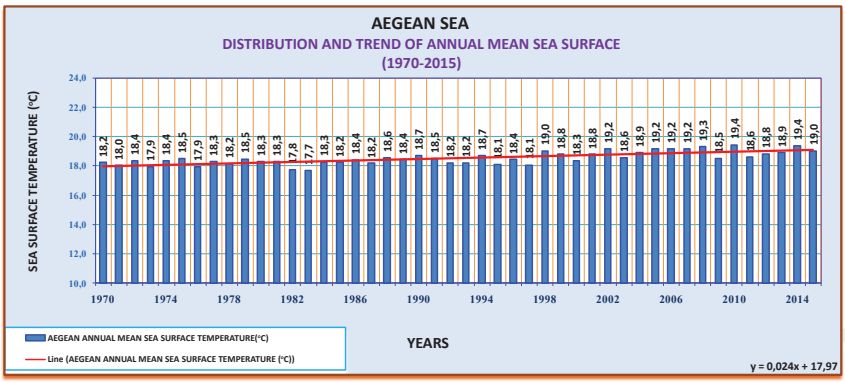
This impact indicator represents the annual change in sea surface temperature. The actual sources of atmospheric weather events and air masses are oceans and seas. Warming and cooling in sea surface are the most accurate indicators of climate change and changes in sea surface temperature effect many living creatures by changing the ecological structure in the sea.

Sea temperature does not give a quick response to atmospheric warming or cooling; however, air temperature responds immediately to any change. Sea water heats up and cools down slower than land; therefore, sea surface temperature is a meteorological parameter which does not show any sudden change. The major factors affecting sea surface temperature are latitude, salinity, cold water currents and direction of blowing wind.

GRAPH 17- MEDITERRANEAN SEA SURFACE TEMPERATURES THROUGH THE YEARS (°C)

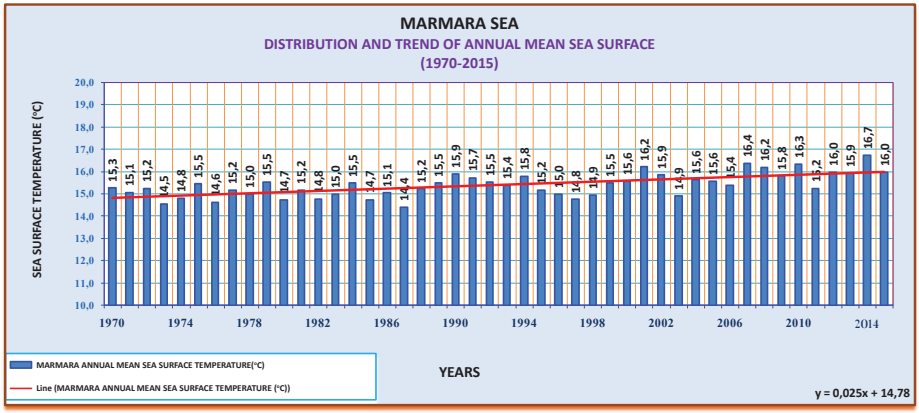


GRAPH 18- AEGEAN SEA SURFACE TEMPERATURES THROUGH THE YEARS (°C)

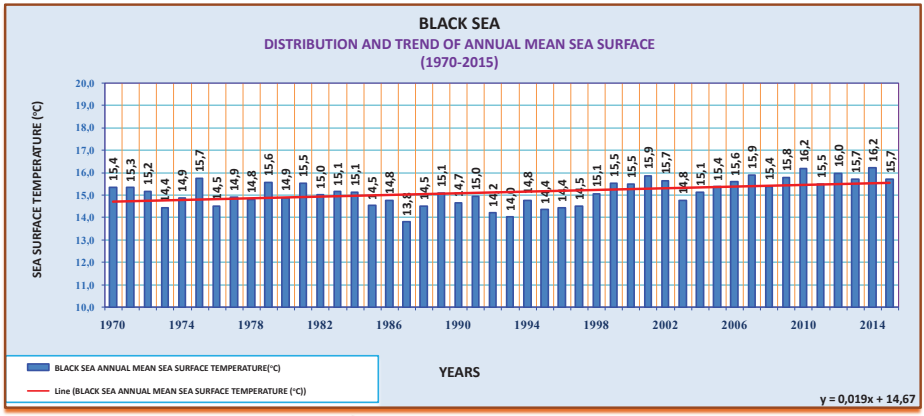


Source: Ministry of Forestry and Water Affairs, Turkish State Meteorological Service

GRAPH 19- MARMARA SEA WATER TEMPERATURES THROUGH THE YEARS (°C)



GRAPH 20-BLACK SEA WATER TEMPERATURES THROUGH THE YEARS (°C)



Source: Ministry of Forestry and Water Affairs, Turkish State Meteorological Service

According to the database of Turkish State Meteorological Service (TSMS), although there is a slight increase in long-term annual mean sea temperature in Turkey, it is not possible to mention a warming at a global scale. To monitor this process, measurements of sea surface temperature covering all of our coasts and seas are taken by TSMS. Datasets will be at a higher resolution in the future.

The mean sea temperature values in 2015 are 21.8 ° C in the Mediterranean Sea, 19.0 ° C in the Aegean Sea, 16.0 ° C in the Marmara Sea and 15.7 ° C in the Black Sea. Measured annual mean sea surface temperatures (in ° C) in years between 1970-2015 are given in the Graphs 18-21. [18].

4.1 - Air Pollutant Emissions

D P S I R

Air pollutant emissions, as an important pressure indicator, show the amount of national emissions of major air pollutants by years and source sectors.

Data comes from the national air emissions inventory for, NO_X (nitrogen oxides), SO_2 (sulphur dioxide), NMVOC (non-methane volatile organic compounds), NH_3 (ammonia), PM_{10} (particulate matter) and CO (carbon monoxide) prepared annually for the reporting requirements of the UNECE CLRTAP (United Nations Economic Commission for Europe, Convention on Long-Range Transboundary Air Pollution (CLRTAP).

Each year the inventory of the second previous year is prepared.
In 2014, for SO_2 72% of the emissions were caused by energy production-power plants, 13% by residential heating. 35% of NO_X emissions were caused by heavy-duty vehicles and 24% by energy production-power plants. Residential heating caused 14% of the total NMVOC emissions. Main reasons of the NH_3 emissions were synthetic fertilizer use and livestock farming.

General increase was observed in the trend of emissions between 1990 and 2014, despite a small decrease of combustion emissions. The reasons of this situation could be explained by the increase on the fuel consumption due to increasing power demand of the increasing population.

Compared to the 1990 emissions data, NH_3 emissions showed a high increase with a percentage of 113%. Respectively the highest emissions were NO_X (%87), SO_2 (23%), CO (22%), NMVOC (16%) and PM_{10} (12%).

Compared to the emissions in 2013, SO_2, PM_{10} and NO_X emissions increased by 10.5%, 6% and 0.8%, respectively. Other emissions appear to be declining. Table 12 shows the emission changes compared to the previous year together with the time series.

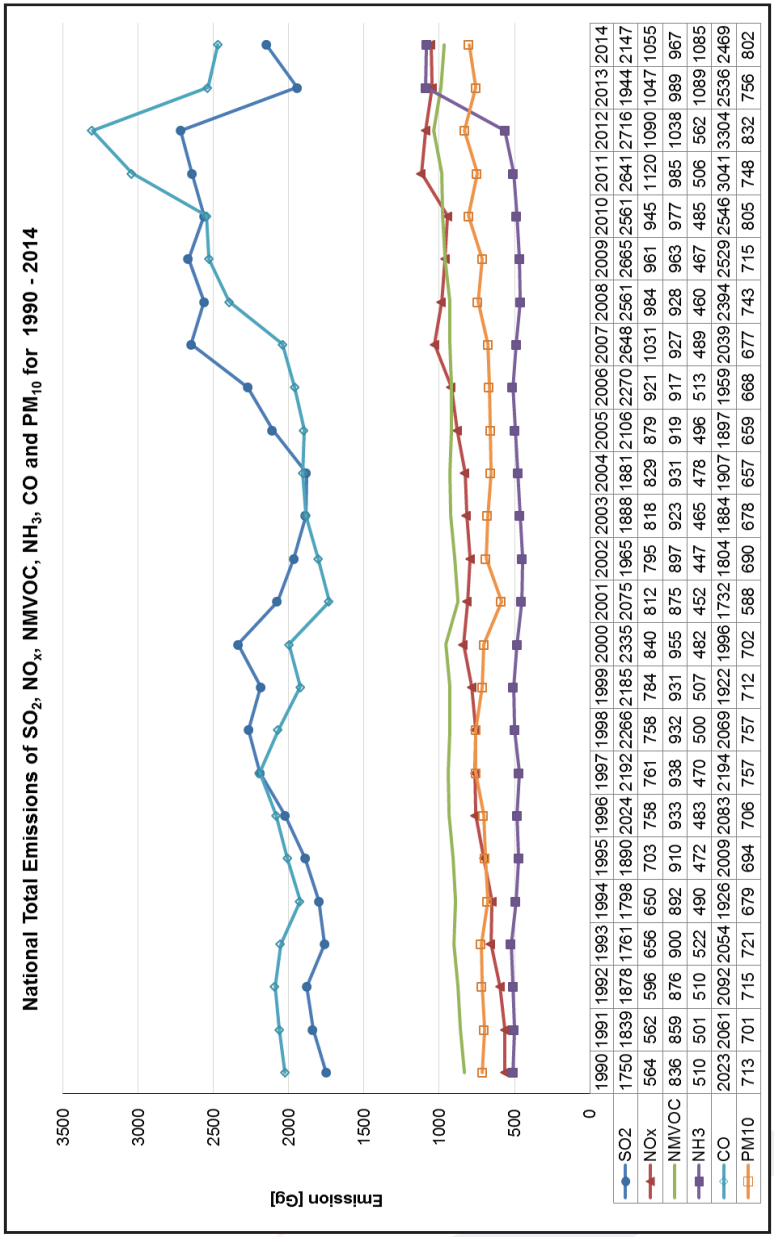
Anthropogenic emissions of the main air pollutants decreased significantly in EU-28 countries between 1990 and 2013; NO_X emissions decreased by 54%, SO_X emissions by 87%, NMVOC emissions by 59%, NH_3 emissions by 27% and $PM_{2.5}$ emissions by 34% [14].

TABLE 12- PERCENT CHANGE OF AIR POLLUTANT EMISSIONS IN TURKEY IN 2014 COMPARED TO 1990 AND 2013

Trend (%)	SO_2	NO_X	NMVOC	NH_3	CO	PM_{10}
1990-2014	23%	87%	16%	113%	22%	12%
2013-2014	10.5%	0.8%	-2.3%	-0.4%	-2.6%	6.0%

Source: Ministry of Environment and the Urbanisation, General Directorate of Environmental Management

GRAPH 21- 1990-2014 TOTAL EMISSIONS OF SO_2, NO_X, NMVOC, NH_3, CO AND PM_{10}



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
SO2	1750	1839	1878	1761	1798	1890	2024	2192	2266	2185	2335	2075	1965	1888	1881	2106	2270	2648	2561	2665	2561	2641	2716	1944	2147
NOx	564	562	596	656	650	703	758	761	758	784	840	812	795	818	829	879	921	1031	984	961	945	1120	1090	1047	1055
NMVOC	836	859	876	900	892	910	933	938	932	931	955	875	897	923	931	919	917	927	928	963	977	985	1038	989	967
NH3	510	501	510	522	490	472	483	470	500	507	482	452	447	465	478	496	513	489	460	467	485	506	562	1089	1085
CO	2023	2061	2092	2054	1926	2009	2083	2194	2069	1922	1996	1732	1804	1884	1907	1897	1959	2039	2394	2529	2546	3041	3304	2536	2469
PM10	713	701	715	721	679	694	706	757	757	712	702	588	690	678	657	659	668	677	743	715	805	748	832	756	802

Source: *Ministry of Environment and Urbanisation, Directorate General of Environmental Management*

4.2- Average Values of PM_{10} and SO_2 in Ambient Air

D P S I R

Pollutant concentration in ambient air is a major state indicator regarding air pollution. Hence, air quality is continuously monitored in all 81 provinces by the monitoring stations operated within "National Air Quality Monitoring Network". Data provided by these monitoring stations are publicly available online at: www.havaizleme.gov.tr .

According to the information obtained from the National Air Quality Monitoring Network, the stations with highest 10 annual average PM_{10} and SO_2 measurements are presented in Table 13.

Within the scope of "Clean Air Action Plans" in order to improve air quality in the provinces; it is necessary to increase the effectiveness of mitigation measures such as: control of fuel types used for domestic heating, improve combustion systems, thermal isolation of the buildings, stoker training and measures to abate pollution from motor vehicles.

TABLE 13- AIR QUALITY MONITORING STATIONS WITH THE HIGHEST PM_{10} AND SO_2 AVERAGES IN 2015

STATIONS	PM_{10} ($\mu g/m^3$)*
MUS	132
IGDIR	121
ISTANBUL - ESENYURT-M-CAC	116
BURSA	105
SIIRT	103
KAYSERI - 3 (HURRIYET)	98
DUZCE	95
BATMAN	92
AFYON	89
MANISA	89

STATIONS	SO_2 ($\mu g/m^3$)*
EDIRNE - KESAN-MCAC	321
SIRNAK	119
MANISA - SOMA	106
CANAKKALE - CAN-MCAC	86
YOZGAT	45
TEKIRDAG (Center MCAC)	44
ISTANBUL (Uskudar)	38
AFYON	31
DENIZLI (Bayramyeri)	31
KARABUK	30

** Assessment done with the validated hourly average values where data availability is above 90%.*
MCAC: Marmara Clean Air Center

Source: Ministry of Environment and Urbanisation General Directorate for EIA, Permitting and Inspection, Department of Laboratory, Measurement and Monitoring.

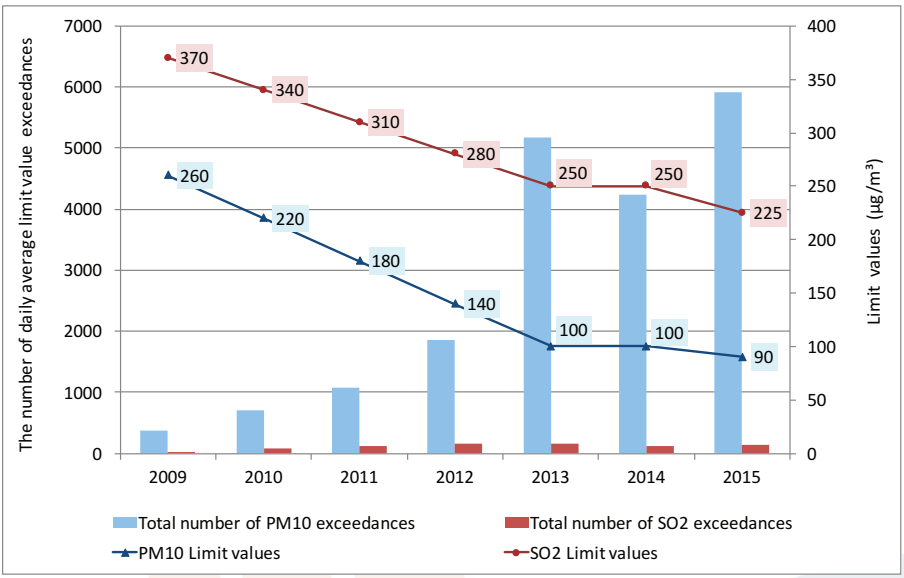
4.3- Number of Exceedances of Air Quality Limit Values

D P S I R

This state indicator shows how often the air pollution exceeds the (daily) limits. Number of exceedances has been increasing over the years; one reason of this is the air quality limit values decreasing in cascades since 2009 as identified in the By-Law on Air Quality Assessment and Management (BAQAM). Increasing number of exceedences also shows a decrease in air quality.

In 2015, daily limit values are: 90 µg/m^3 for PM_{10} and 225 µg/m^3 for SO_2. For the 120 stations that were in operation since 2009, exceedances for PM_{10} and SO_2 increased respectively by 39% and 15% in 2015 compared to 2014. Monitoring stations operated by Marmara and Samsun Clean Air Centers are not considered here; when these stations are also accounted for, total exceedences in 2015 rise to 7900 for PM_{10} and 406 for SO_2. 91% of Turkey's population is exposed to PM_{10} levels exceeding the limit value while 18% is exposed to SO_2 levels in excess of the limit.

GRAPH 22- AIR QUALITY LIMITS AND NUMBER OF EXCEEDANCES OVER THE YEARS



Source: Ministry of Environment and the Urbanisation, Air Quality Newsletters (2009-2015).
NOTES: 1. Exceedances are assessed by daily (24 hourly) average values of the measurement results.
2. The data of 120 stations, which have been operating since 2009, are taken as basis.
3. Limit values were determined as: For PM10, 260 µg/m³ (2009), 220 µg/m³ (2010), 180 µg/m³ (2011), 140 µg/m³ (2012), 100 µg/m³ (2013 and 2014) and 90 µg/m³ (2015). For SO2; 370 µg/m³ (2009), 340 µg/m³ (2010), 310 µg/m³ (2011), 280 µg/m³ (2012), 250 µg/m³ (2013 and 2014) and 225 µg/m³ (2015).

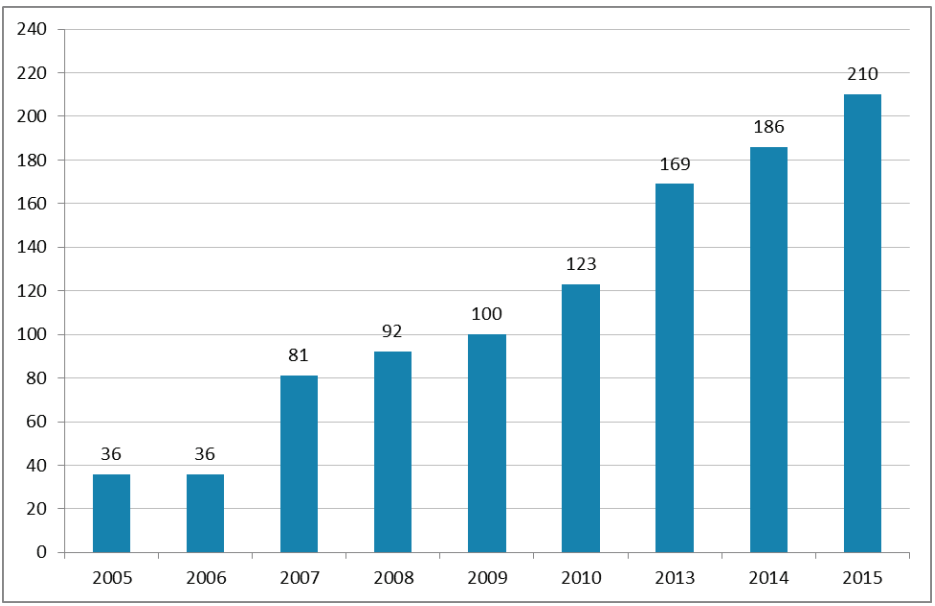
4.4- The Number of Air Quality Monitoring Stations

D P S I R

As a response indicator, this shows the number and qualifications of the monitoring stations in order to obtain more reliable air quality data.

In Turkey there are 210 air quality monitoring stations most of which are located in urban areas representing domestic heating sources. A limited number of stations also represent traffic and industrial sources. However, according to European Union criteria, such stations should be established in respect to the area they represent; urban, suburban and rural; and with respect to source types as traffic, heating or industry. To determine the locations of the station to be founded accordingly, preliminary assessment studies have been being carried out since 2011.

GRAPH 23- NUMBER OF AIR QUALITY MONITORING STATIONS THROUGH THE YEARS



Source: Ministry of Environment and the Urbanisation, General Directorate of EIA, Permit and Inspection, Department of Laboratory, Monitoring, and Measuring

Among the existing 210 stations in operation, 174 stations measure PM10, 34 stations $PM_{2.5}$, 182 measure SO_2, 97 stations measure NOx, 59 O_3 and 45 stations measure CO.

Taking into account the number of stations to be set up according to the European Union norms, the number of existing stations should be at least 330 when population data reference is regarded as basis. The Ministry foresees to meet this target by the end of 2017.

5.1- Use of Freshwater Resources

D P S I R

This indicator is a pressure indicator. Total water consumption indicates the use of water sources (surface and underground) to meet the requirements such as drinking water and water demand of industry and agriculture. Water consumption is the indicator of the pressure on the fresh water bodies.

Based on the data of General Directorate of State Hydraulic Works about irrigation and the data of TURKSTAT about other types of water consumption, 70.9% of the water drawn was used for agricultural irrigation, 18% for industry, and 11.2% as public water use.

Based on the 2006 data presented by United Nations Food and Agriculture Organization (FAO) and published in 2012, 69% of the water source is used for irrigation, 19% for industry and 12% for domestic use in the world. However, ,water resources in European countries which are member to European Environment Agency (EEA) excluding Turkey, 35.9% is used for agriculture, 32.2% for domestic use and 31.9% for industrial use (including mining and quarries) according to EEA data [19].

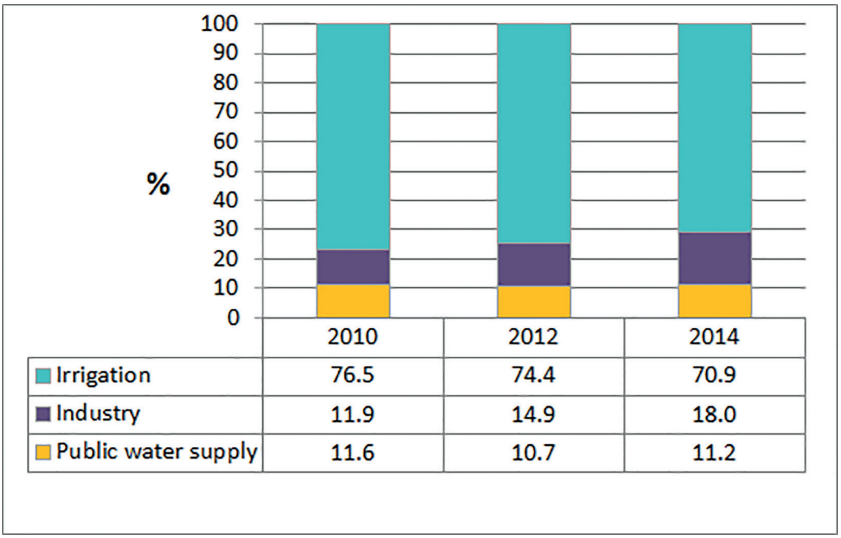
TABLE 14-AMOUNT OF WATER DRAWN FROM WATER BODIES WITH REGARD TO USAGE

(Billion m^3/year)

YEARS	2008	2010	2012	2014
Municipalities	4.56	4.79	4.93	5.23
Villages	1.22	1.01	1.04	0.43
Manufacturing Industry Activities	1.20	1.50	1.67	2.20
Thermal Power Plants	4.54	4.27	6.40	6.53
Organized Industrial Zones	0.11	0.11	0.12	0.14
Mining Facilities	... (*)	0.05	0.11	0.21
Irrigation	33.77	38.15	41.55	35.85
Total		**49.89**	**55.81**	**50.59**

(*) No Information.
Note: TURKSTAT data is included for use in sea water.
Source: TURSTAT, "Sectoral Water and Wastewater Statistics" Press Release http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=21626
Source For 'Irrigation' Values: Ministry of Forestry and Water Affairs General Directorate of State Hydraulic Works, http://www.dsi.gov.tr/dsi-resmi-istatistikler

GRAPH 24- WATER USAGE BY SECTORS, (2010-2014)



	2010	2012	2014
Irrigation	76.5	74.4	70.9
Industry	11.9	14.9	18.0
Public water supply	11.6	10.7	11.2

(*) No Information.
Note: TURKSTAT data is included for use in sea water.
Source: TURSTAT, "Sectoral Water and Wastewater Statistics" Press Release http://www.turkstat.gov.tr/PreHaberBultenleri.do?id=21626
Source For 'Irrigation' Values: Ministry of Forestry and Water Affairs General Directorate of State Hydraulic Works, http://www.dsi.gov.tr/dsi-resmi-istatistikler

Water exploitation index (WEI) is the annual total fresh water abstraction in a country as a percentage of its long term average available water (LTAA) from renewable fresh water resources.

Annual mean precipitation in Turkey is 643 mm, which corresponds to 501 Bm^3 (billion m^3) of annual water volume in the country. A volume of 274 Bm3 water evaporates from water bodies, plants and soil to atmosphere. 158 Bm3 is discharged into seas and lakes via running water bodies. 69 Bm^3 of volume of water leaks into groundwater, whereas 28 Bm^3 is retrieved by springs from groundwater contributing to surface water. Also, there are 7 billion m^3 volume of water coming from neighboring countries. Thus, total annual surface runoff amounts to a volume of 193 Bm^3 of water.

Including 41 (69-28) Bm^3 net discharging into groundwater, the gross (surface and groundwater) renewable water potential of Turkey is estimated as 234 (193+41) Bm^3 [20].

WEI of Turkey is 21.3% in 2010, 23.9% in 2012 and 21.6% for 2014. The warning threshold of 20% for this indicator distinguishes a non-stressed from a water scarce region, with severe scarcity occurring where the WEI exceeds 40% [21].

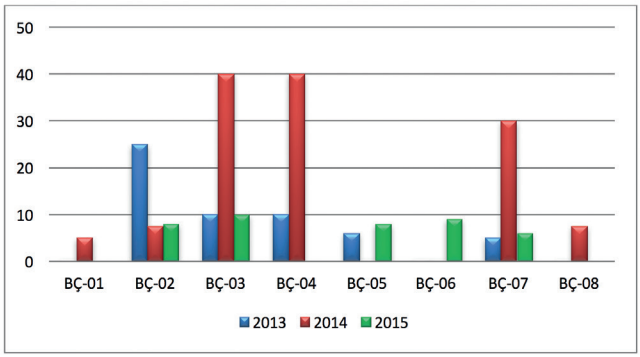
5.2- Oxygen Consuming Substances in Rivers

D P S I R

The primary indicator of the oxygenation state in water bodies is biochemical oxygen demand (BOD) which expresses the demand of oxygen by the living creatures consuming oxidizable organic materials in a body of water. This indicator is a state indicator which shows the present situation and the tendency related with ammonium concentrations (NH_4) and BOD in rivers.

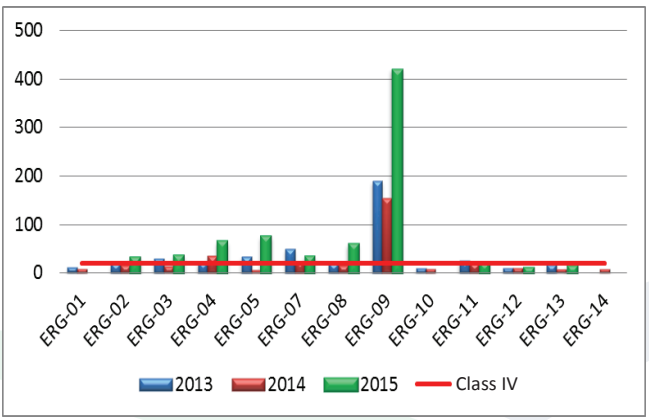
Laboratory, Measuring and Monitoring Department of the Ministry of Environment and Urbanisation carried out Domestic and Industrial Pollution Monitoring Programmes in 2012, 2013, 2014 and 2015. Seasonal monitoring studies have been done in the basins: Ergene, Küçük Menderes, Gediz, North Aegean, Sakarya and Susurluk that have the highest pollution loads. As a result of the studies, Rivers in these basins were found out to be at the class IV quality (highly polluted) water according to the By-Law on Surface Water Quality Management for all these years of monitoring.

GRAPH 25- NORTH AEGEAN (BAKIRCAY) BASIN BOD (mg/L)

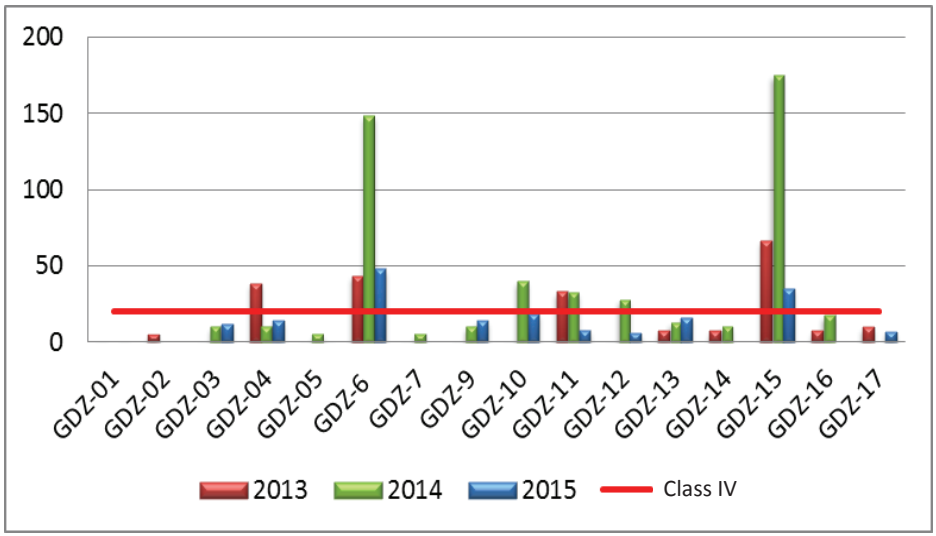


Sources: Domestic and Industrial Pollution Monitoring Programme Monitoring Reports

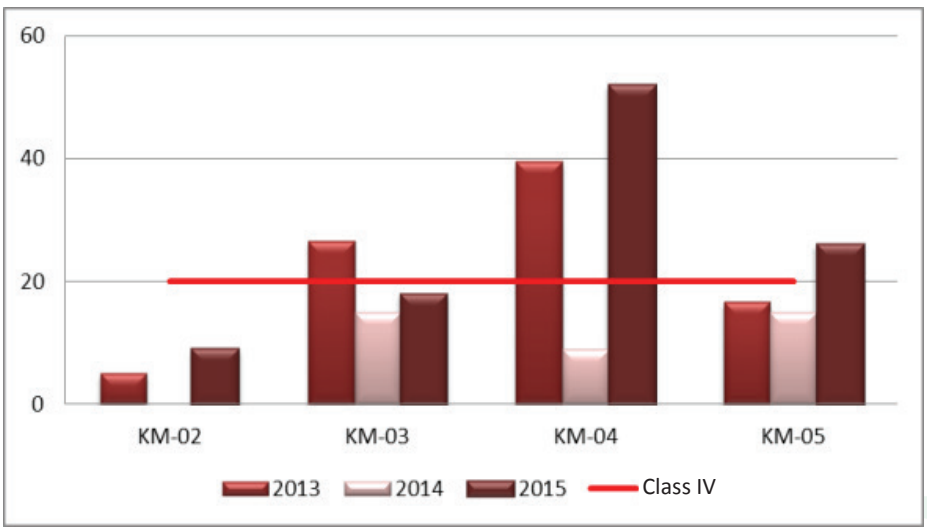
GRAPH 26- ERGENE BASIN BOD (mg/L)



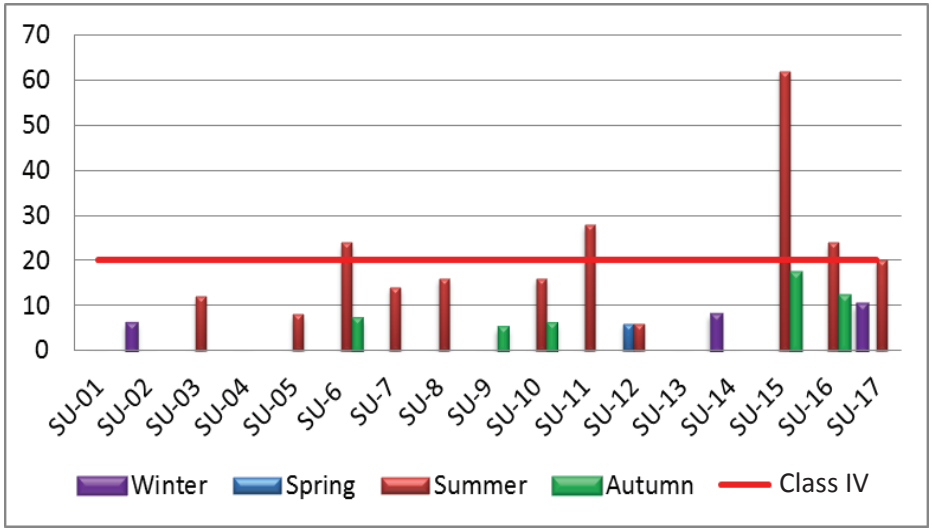
GRAPH 27- GEDIZ BASIN BOD (mg/L)



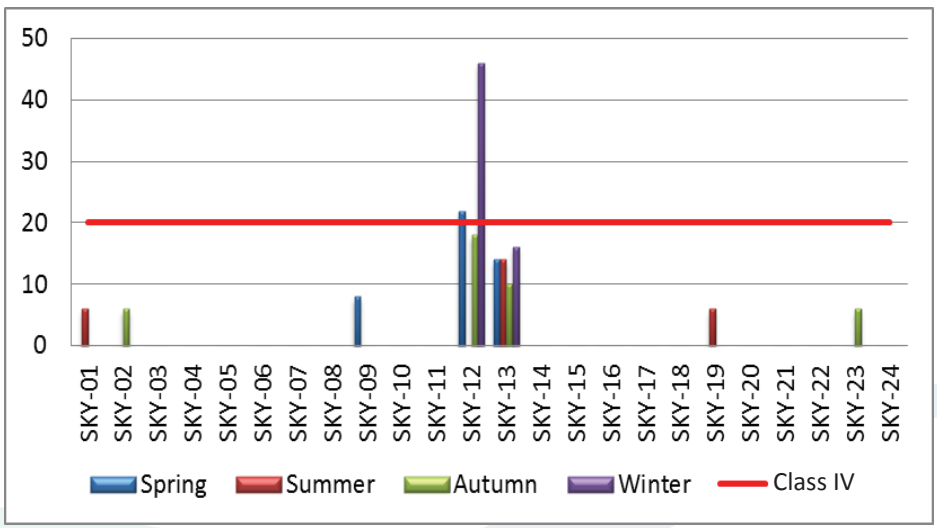
GRAPH 28- KUCUK MENDERES BASIN BOD (mg/L)



GRAPH-29-SUSURLUK BASIN BOD (mg/L) (2015)



GRAPH-30-SAKARYA BASIN BOD (mg/L) (2015)

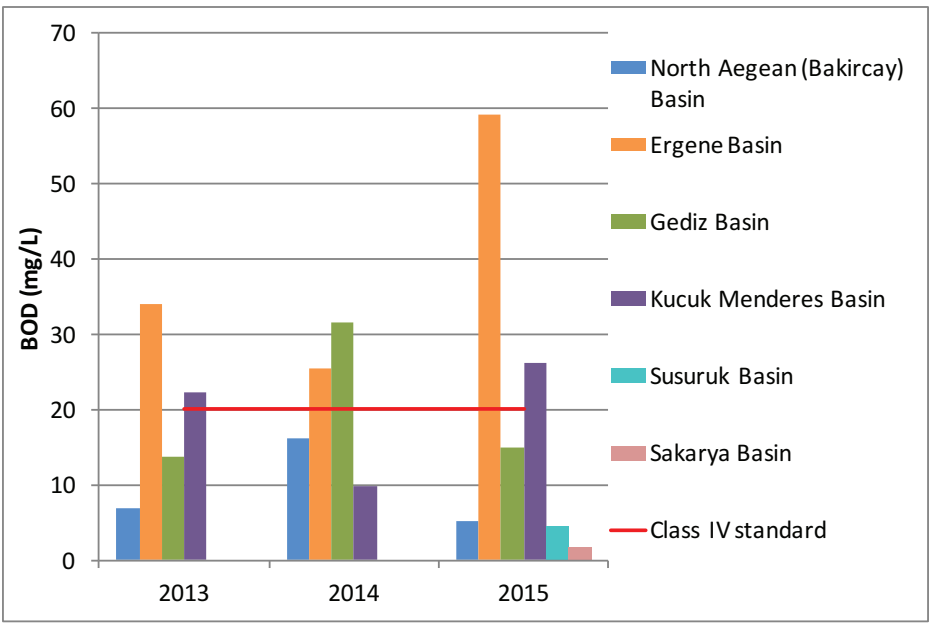


Compared to 2014, in 2015 BOD decreased in Gediz and Bakırçay basin, however increased in Ergene and Kucuk Menderes basins.

Looking at the yearly trends of the averages of the all monitoring stations within the basins, a significant increase in the BOD values in the Ergene basin is observed. Particularly the station ERG-09 shows the high readings. Küçük Menderes basin experienced a BOD increase in 2015 compared to 2014, while there are improvements in Northern Aegean (Bakırçay) and Gediz basins.

In order to determine the pollution real-time and take rapid mitigation measures at source, the Ministry of Environment and Urbanisation is monitoring the pollutant emissions by installing online continuous monitoring stations at the discharge points of wastewater treatment units of installations with a flowrate of 10,000 m^3/day or higher.

GRAPH 31- AVERAGE BOD IN THE HIGHEST POLLUTION LOADS BASINS ANNUALLY (mg/L)



Notes: *1) Basin averages are arithmetic mean of the values from the stations in the basin.*
2) Values below detection limits have been asumed zero.
3) There are no measurement in Susurluk and Sakarya Basins for 2013 and 2014.
Sources: *Domestic and Industrial Pollution Monitoring Programme Monitoring Reports(2015) Not published yet.*

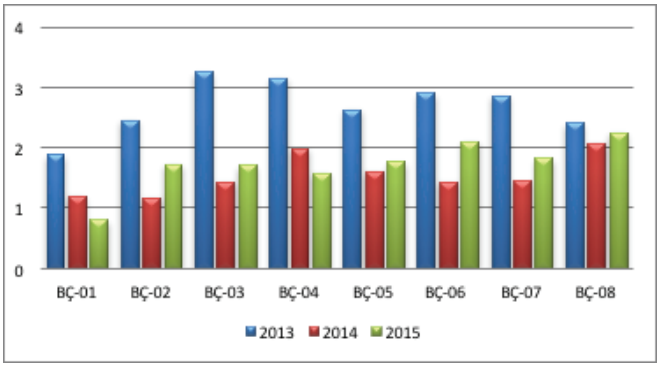
5.3- Nutrients in Freshwater

D P S I R

The state indicator is used to show the current nutrient intensity and the time-wise trends in geographic variations. Widespread nitrogen and phosphorus entry from the urban areas, the industrial and agricultural areas to the water sources can cause eutrophication.

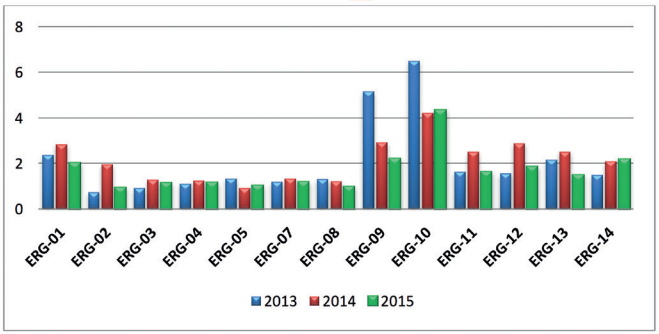
Laboratory, Measuring and Monitoring Department of the Ministry of Environment and Urbanisation carried out Domestic and Industrial Pollution Monitoring Programmes in 2012, 2013, 2014 and 2015. Seasonal monitoring studies have been done in the basins: Ergene, Küçük Menderes, Gediz, North Aegean, Sakarya and Susurluk that have the highest pollution loads. As a result of the studies, Rivers in these basins were found out to be at the class IV quality (highly polluted) water according to the By-Law on Surface Water Quality Management for all these years of monitoring.

GRAPH 32- NORTH AEGEAN (BAKIRCAY) BASIN NITRATE NITROGEN (mg/L)



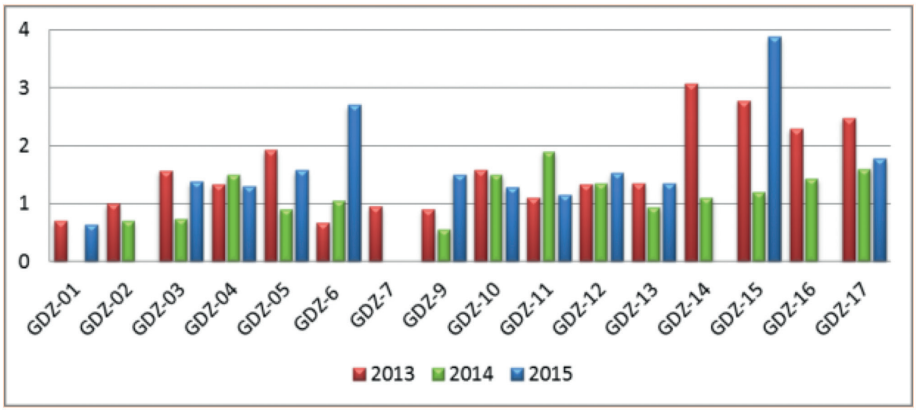
In the North Aegean Basin from 2013 to 2015, Ammonium Nitrogen, nitrite and nitrate has decreased.

GRAPH 33- ERGENE BASIN NITRATE NITROGEN (mg/L)



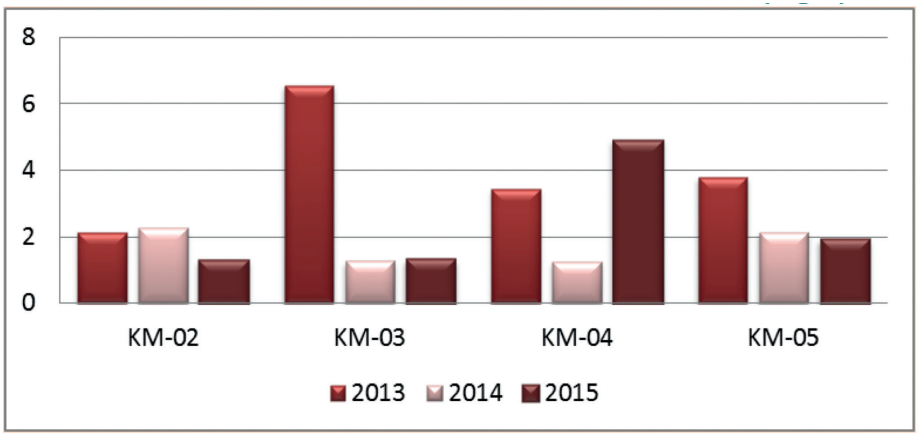
In the Ergene basin from 2013 to 2015, Ammonium Nitrogen and nitrite has increased. On the other hand, there has been no significant change in nitrate.

GRAPH 34- GEDIZ BASIN NITRATE NITROGEN (mg/L)



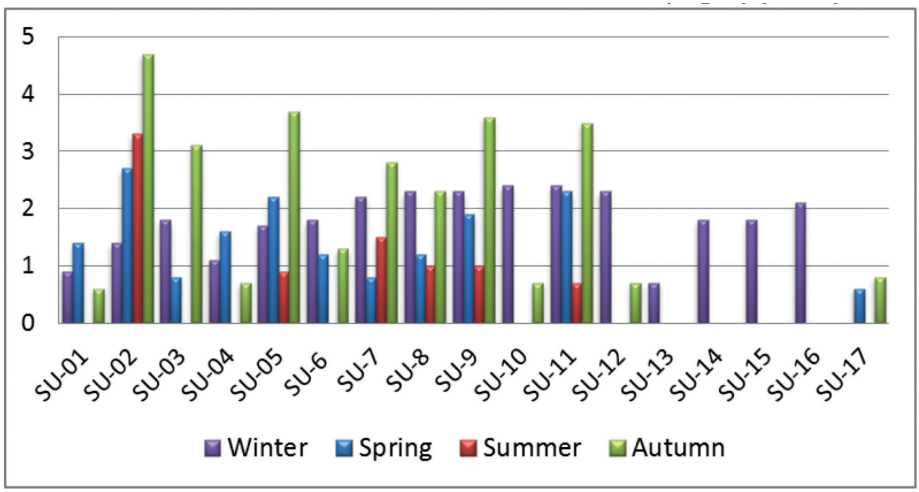
In the Gediz Basin from 2013 to 2015, nitrate has increased in GDZ-06 (Alasehir Stream) ve GDZ-15 (Nif Stream)from 2011 to 2015.

GRAPH 35- KUCUK MENDERES BASIN NITRATE NITROGEN (mg/L)



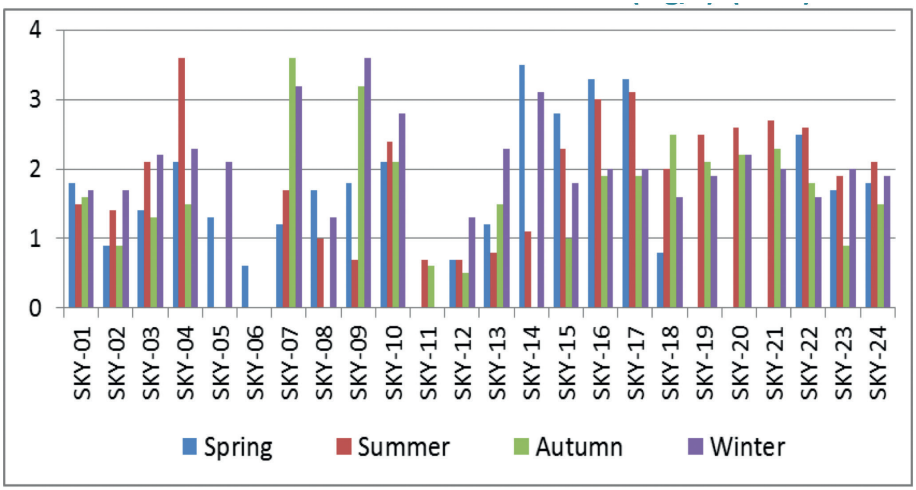
In the K. Menderes basin from 2013 to 2015, nitrate has decreased other than KM-04 point.

GRAPH 36- SUSURLUK BASIN NITRATE NITROGEN (mg/L) (2015)



Susurluk basin 2015 measurement results are generally Class IV (highly polluted water) quality and in autumn, higher values have been measured in many parameters..

GRAPH 37- SAKARYA BASIN NITRATE NITROGEN (mg/L) (2015)

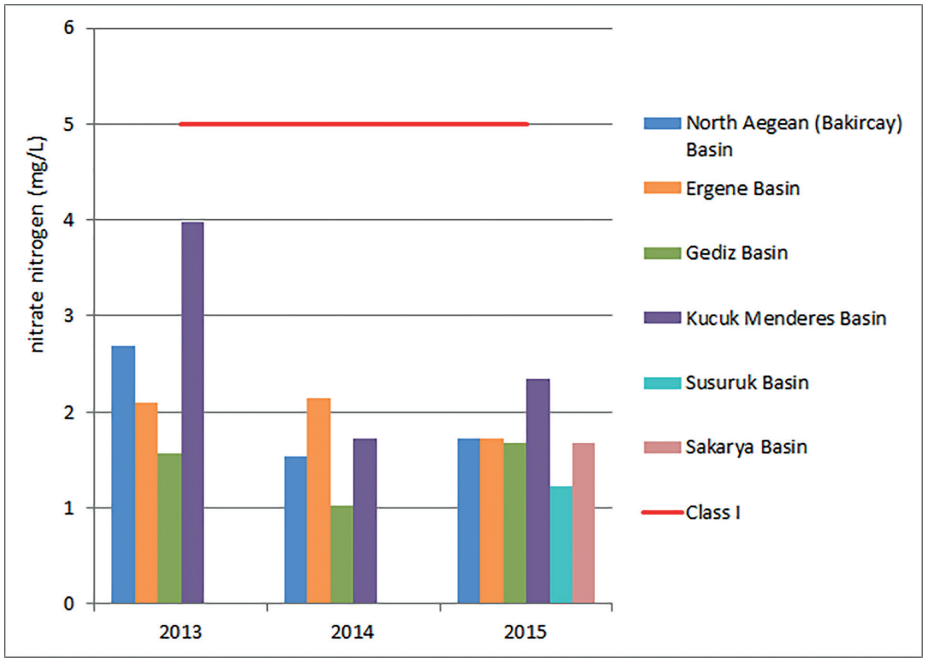


Sakarya Basin 2015 measurement results are generally Class IV (highly polluted water) quality and in spring and summer time, higher values have been measured in many parameters.

Sources: Domestic and Industrial Pollution Monitoring Programme Monitoring Reports

Comparing yearly trends of the averages of the stations within the basins, it's observed that there is a decrease in 2015 in the Nitrate Nitrogen meeasured in the Ergene Basin, contrary to an increase in all other basins. Particularly Küçük Menderes basin has an average higher than the other basins.

GRAPH 38- AVERAGE NITRATE NITROGEN IN THE HIGHEST POLLUTION LOADS BASINS ANNUALLY (mg/L)



Notes: *1) Basin averages are arithmetic mean of the values from the stations in the basin.*
2) Values below detection limits have been asumed zero.
3) There are no measurement in Susurluk and Sakarya Basins for 2013 and 2014.

Sources: *Domestic and Industrial Pollution Monitoring Programme Monitoring Reports(2015) Not published yet.*

5.4- Bathing Water Quality

D P S I R

Indicator is a state indicator related with the impacts of household wastewaters on the marine and coastal waters.

Every year in swimming season, bacteriologic monitoring activities are performed in sea and lake water in 34 cities with a coast to sea or lake by Ministry of Health Public Health Institution of Turkey to protect individual and public health.

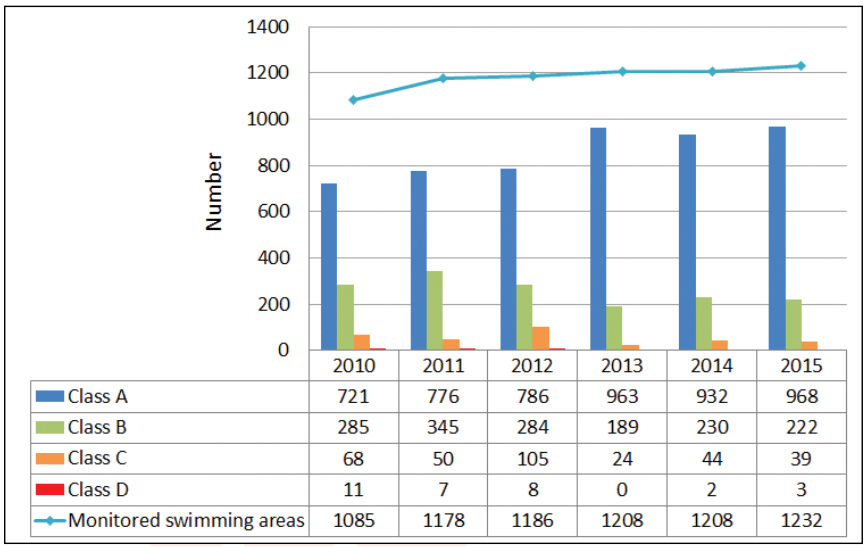
The number of swimming areas monitored was 1085 in 2010, while water quality monitoring activities were carried out in a total of 1232 swimming areas in 2015.

In 2015, 78.6% of the 1232 of swimming areas are categorized as Class A (very good), 18% Class B (good), 3.2% Class C (poor) and 0.2% Class D (very poor) [23].

TABLE 15- RESULTS OF BATHING WATER QUALITY 2015

THE NUMBER OF MONITORED PROVINCES	TOTAL NUMBER OF SWIMMING AREAS	MONITORED PARAMETERS AND TOTAL ANALYSIS VALUES			SWIMMING AREAS THAT MEET THE MANDATORY REQUIREMENTS		SWIMMING AREAS THAT DO NOT MEET THE MANDATORY REQUIREMENTS	
		TOTAL COLIFORM	FECAL COLIFORM	FECAL STREPTOCOCCUS	CLASS A	CLASS B	CLASS C	CLASS D
34	1232	13354	13354	13354	968	222	39	3

GRAPH 39- COMPARING SWIMMING AREAS WITH REGARDS TO QUALITY CLASSES 2010-2015



	2010	2011	2012	2013	2014	2015
Class A	721	776	786	963	932	968
Class B	285	345	284	189	230	222
Class C	68	50	105	24	44	39
Class D	11	7	8	0	2	3
Monitored swimming areas	1085	1178	1186	1208	1208	1232

Source: Ministry Of Health, Public Health Institution of Turkey.
Note: According to By-law on Bathing Water Quality following qualities represents Class A Very Good/ Excellent, Class B good Quality, Class C poor Quality and Class D Very poor Quality/Needs to be Banned.

5.5- Municipal Water Supply

D P S I R

Indicator represents the pressure on water resources. Reservoirs are the most important and widely used water supply for the municipalities. In years of less precipitation, water exploited from the reservoirs may decrease while exploitation from rivers, lakes or ponds increases.

In 2014, population served by water supply networks forms 91% of Turkey's population and 97% of total municipal population.

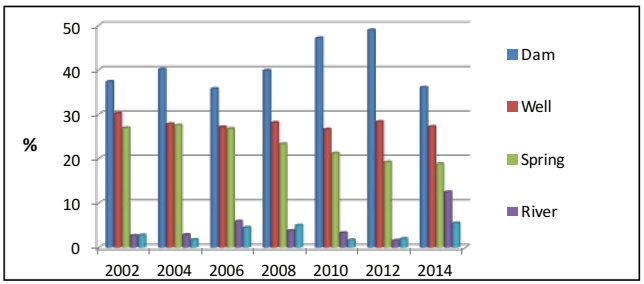
While 4.94 billion m³ of water was drawn for municipal potable water in order to be distributed in 2012, this number increased to 5.24 billion m³ in 2014.

According to 2014 data, the ratio of the population of the municipalities served by drinking water treatment plants was calculated as 54% in the population of Turkey and 58% in the population of municipalities. Out of 5.2 billion m³ of water abstracted to water supply network, 3 billion m³ (57.2%) was treated in drinking water treatment plants. 95.5% of this amount was treated by conventional methods, 2.9% was treated by advanced methods, and 1.6% was treated by physical methods. In 2014, through the drinking and potable water networks 3.39 billion m³ drinking and potable water was distributed to 25.7 million subscribers[24].

TABLE 16- WATER ABSTRACTION FOR MUNICIPAL WATER SUPPLY NETWORKS BY SOURCES (%)

YEARS	Dam	Well	Spring	River	Lake/ Reservoir
2002	37.3	30.2	26.9	2.7	2.8
2004	40.1	27.8	27.5	2.9	1.8
2006	35.7	27.1	26.7	5.9	4.5
2008	39.8	28.1	23.3	3.8	5.0
2010	47.1	26.6	21.2	3.3	1.7(*)
2012	48.9	28.3	19.2	1.6	2.0(*)
2014	36.0	27.2	18.8	12.5	5.5(*)

GRAPH 40- WATER ABSTRACTION FOR MUNICIPAL WATER SUPPLY NETWORKS BY SOURCES (%)



Source: *TURKSTAT*
Note: *Since 2004 data has been collected once in two years.*
(*) 2010, 2012 and 2014 Sea Water is included in the value of "Lake-Pond".

5.6- Municipalities Served by Wastewater Treatment Unit

D P S I R

This indicator is a response indicator. Indicator is an important tool for monitoring the success of the policies implemented for the control of pollution arising from domestic wastewater.

In order to use water more efficiently and protect available water resources, wastewater treatment is an important application. As a result of significant investments made by Turkey in this area, while in 1994, rate of number of municipalities served by wastewater treatment plants in total municipal number was 3%, in 2014 this number reached to 37%. The ratio of municipality population serviced by wastewater treatment facilities to the total population of city councils has reached to 68% by year 2014 [25].

The cities with a population of more than 100.000 is given priority for building wastewater treatment plants. By the end of 2014, 82% of the 228 municipalities, with a population of more than 100.000, benefit from the wastewater treatment plant services.

GRAPH 41- NUMBER OF MUNICIPALITIES AND POPULATION RATIO SERVED BY WASTEWATER TREATMENT PLANTS (%)

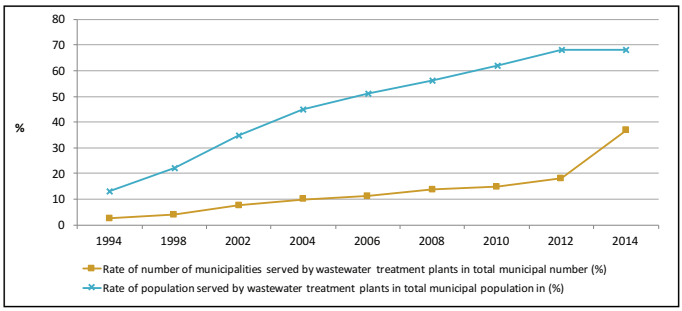


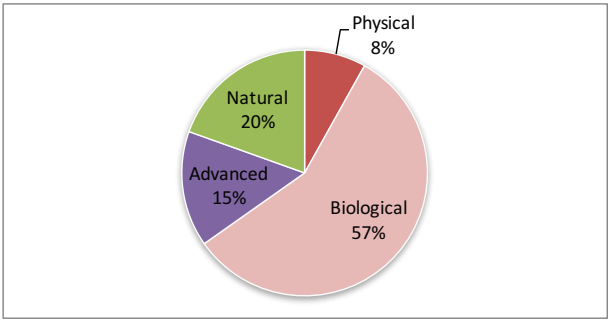
TABLE 17- NUMBER OF MUNICIPALITIES AND POPULATION RATIO SERVED BY WASTEWATER TREATMENT PLANTS

YEARS	1994	1998	2002	2004	2006	2008	2010	2012	2014
Rate of Number of Municipalities Served by Wastewater Treatment Plants in Total Municipal Number (%)	3	4	8	10	11	14	15	18	37
Rate of Population Served by Wastewater Treatment Plants in Total Municipal Population (%)	13	22	35	45	51	56	62	68	68

Source: TURKSTAT

The number of the wastewater treatment plants which was 145 in 2002, reached to 604 in 2014. Looking at the distribution of these facilities, 15.21% of the wastewater treatment plants are advanced treatment plants, 57.12 % are biological treatment plants, 8.11 % are only physical treatment and 19.54% are natural treatment plants.

GRAPH 42- THE NUMBER OF WASTEWATER TREATMENT PLANTS, AS OF 2014



Source: TURKSTAT

Considering the situation in Europe; in accordance with the 2009 data, approximately 80% of the North and South European population were connected to wastewater treatment plants. In the central European countries, this amount was much higher and exceeded 90% [26].

According to TURKSTAT data, the rate of advanced treatment was 41.6%, while the rate of biological treatment was 33.2%, the rate of physical treatment was 25.0% and the rate of natural treatment was 0.2% in 2014 [25].

With reference to the data presented by TURKSTAT, the population rate connected to the least secondary (biological) wastewater treatment plants was 41.96% in 2012. With regard to the sustainable development data of EUROSTAT, this rate was 99.5% in Great Britain, 99.4% in Netherlands, 97.3% in Switzerland, 95.3% in Germany, 93% in Spain, 83% in Finland and 64.5% in Poland in 2010 [28].

Since the higher energy needs of wastewater treatment plants increase operational costs and negatively affect the operation of the facilities, in order to provide the operating of wastewater treatment plants effectively and improve the receiving water body quality, Ministry of Environment and Urbanisation has issued a By-Law for Subsidizing Energy Costs of Wastewater Treatment Plantss. 50% of the electricity costs of the treatment plants that were certified by the Ministry is subsidized in this regard. During the period from the date of entry into force of the By-Law until the end of 2015, Reimbursement Certificates of Energy Incentive were given 436 of plants provided the conditions under the By-Law by the Ministry. In this context, in 2011 23 million TL to 172 plants, in 2012, 27 million to 212 plants, in 2013 30.2 million to 207 plants and in 2014 30.4 million to 225 plants, in 2015 46.4 million to 294 plants were paid as energy incentives.

5.7- Municipalities Served by Sewerage Systems

D P S I R

The indicator is a response indicator that represents the ratio of municipality population served by sewerage systems to the total municipal population.

In 2014, population that is served by sewerage systems has a share of 84% in Turkey's population and a share of 90% in total municipal population.

As of year 2014 the total number of municipalities is 1396, of which 1309 (94% of the municipalities) are served by the sewerage system.

Average daily per capita amount of wastewater discharged from municipal sewerage systems which was 126 litres in 1994, has increased to 181 litres in 2014 [25].

GRAPH 43- RATE OF POPULATION AND MUNICIPALITIES SERVED BY SEWERAGE SYSTEMS

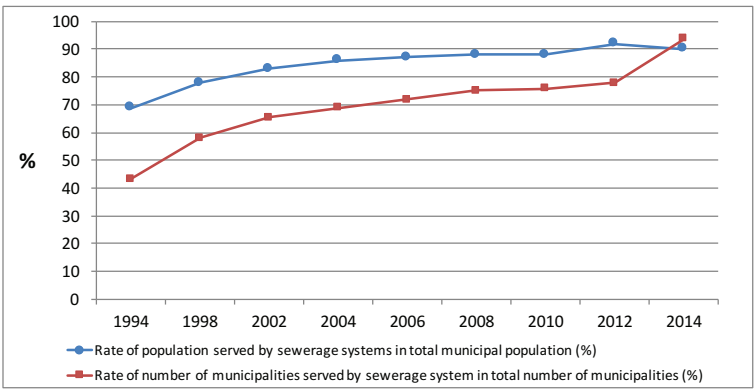


TABLE 18- RATE OF POPULATION AND MUNICIPALITIES SERVED BY SEWERAGE SYSTEMS

YILLAR	1994	1998	2002	2004	2006	2008	2010	2012	2014
Rate of Population Served by Sewerage Systems in Total Municipal Population (%)	69	78	83	86	87	88	88	92	90
Rate of Number of Municipalities Served by Sewerage System in Total Number of Municipalities (%)	43	58	66	69	72	75	76	78	94
Average Amount of Wastewater Discharged per capita per day (litres/ capita-day)	126	154	154	174	181	173	182	190	181

Source: TURKSTAT

6.1- Amount of Municipal Waste and Disposal

D P S I R

Regarding the waste management principles; the waste should be primarily minimized at source, then recovery, energy recovery and finally disposal methods should be applied. Waste generation amounts are pressure, while collection, disposal and recycle/recovery amounts of these wastes are response type indicators.

GRAPH 44- AMOUNT OF MUNICIPAL WASTE BY DISPOSAL METHODS (%), 2014

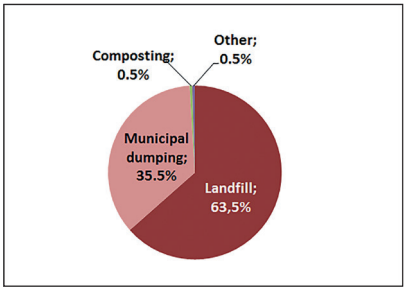
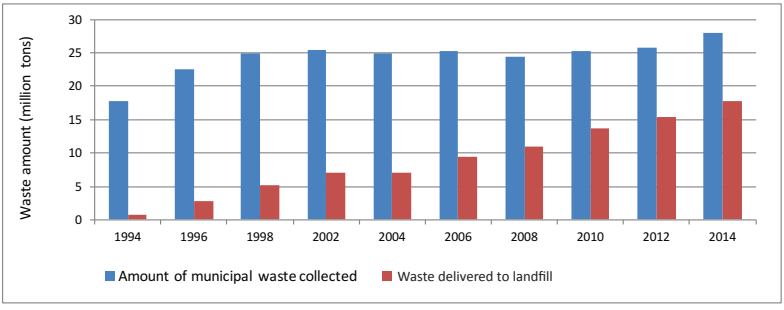


TABLE 19- MUNICIPAL WASTE DISPOSAL THROUGHOUT THE YEARS

YEARS	1994	1996	1998	2002	2004	2006	2008	2010	2012	2014
Amount of Municipal Waste Collected (Million Tonnes)	17.76	22.48	24.95	25.37	25.01	25.28	24.36	25.28	25.85	28.01
Waste Delivered to Landfill Site (Million Tons)	0.81	2.85	5.26	7.05	7.00	9.43	10.95	13.75	15.48	17.81
Rate of Collected Household Waste Sent to the Landfills (%)	4.6	12.7	21.1	27.8	28.0	37.3	45.0	54.4	59.9	63.5

GRAPH 45-AMOUNT OF MUNICIPAL WASTE AND DISPOSAL THROUGHOUT THE YEARS



Source: TURKSTAT

According to TURKSAT survey results average amount of municipal waste per capita per day was calculated as 1.08 kg in 2014.

According to EUROSTAT 2012 data, the average annual municipal waste produced per capita by EU-27 countries was 492 kg while that produced in Turkey was 407 kg based on TURKSTAT data.

6.2- Number of Landfills – Municipalities -Population Covered by Landfills

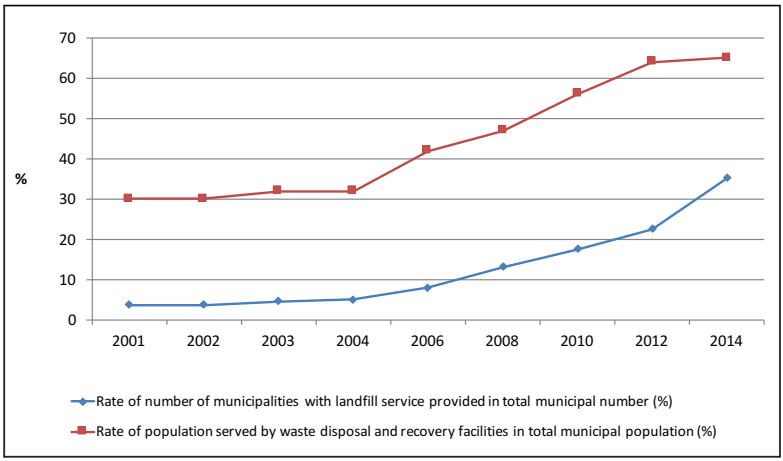
D P S I R

Waste management facilities in urban areas in Turkey , while there were 15 landfills in 2003, it increased up to 38 in 2008, 59 in 2011, 69 in 2013, 79 in 2014 and 81 in 2015 [14].

According to TURKSTAT data, rate of population served by waste disposal and recovery facilities in total municipal population is 65% in 2014.

This ratio is targeted to increase up to 83% by year 2017 and by the end of 2023 it is targeted to refurbish the existing infrastructure and raise the ratio to 100%.

GRAPH 46- THE RATE OF POPULATION SERVED BY WASTE DISPOSAL AND RECOVERY FACILITIES IN TOTAL MUNICIPAL POPULATION (%)



Source: TURKSTAT

TABLE 20- THE RATE OF POPULATION SERVED BY WASTE DISPOSAL AND RECOVERY FACILITIES IN TOTAL MUNICIPAL POPULATION (%)

YEARS	2001	2002	2003	2004	2006	2008	2010	2012	2014
Rate of number of municipalities with landfill service provided in total number of municipalities (%)	4	4	5	5	8	13	18	23	35
Rate of population served by waste disposal and recovery facilities in total municipal population (%)	30	30	32	32	42	47	56	64	65

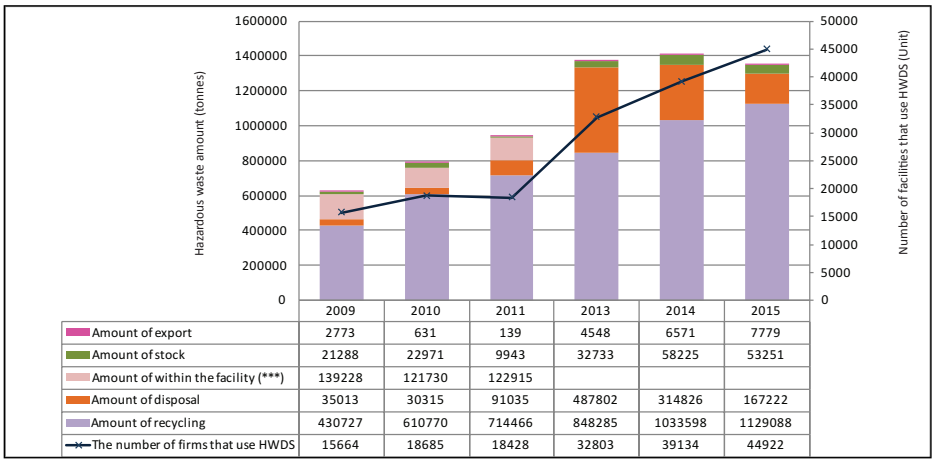
Source: TURKSTAT

6.3- Hazardous Waste

Hazardous waste, especially originating from the industrial plants, is an important pressure indicator for the environment.

A nation-wide proportion of hazardous waste generation can be identified with the Hazardous Waste Declaration System (HWDS) used by the industrial plants generating waste during the operational processes. By the end of 2015, 44,922 plants used the HWDS. The amount of the processed hazardous waste for 2015 was calculated as 1,357,340 tonnes, excluding the waste generated by the mining industry. 83.2% of the mentioned total was directed to recycling; 12.3% was disposed of; 3.9% stored and 0.6% was exported.

GRAPH 47- DATA FROM THE HAZARDOUS WASTE DECLARATION SYSTEM (2009-2015)



	2009	2010	2011	2013	2014	2015
Amount of export	2773	631	139	4548	6571	7779
Amount of stock	21288	22971	9943	32733	58225	53251
Amount of within the facility (***)	139228	121730	122915			
Amount of disposal	35013	30315	91035	487802	314826	167222
Amount of recycling	430727	610770	714466	848285	1033598	1129088
The number of firms that use HWDS	15664	18685	18428	32803	39134	44922

TABLE 21- DATA OF HAZARDOUS WASTE DECLARATION SYSTEM FOR (2009-2015) (**)

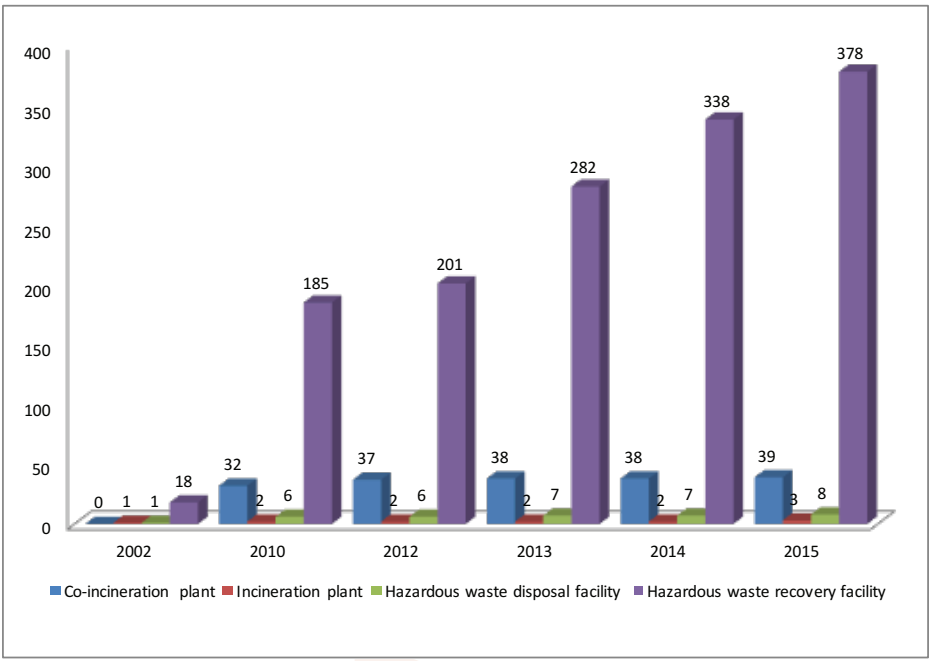
YEARS	2009	2010	2011	2013	2014	2015
Number of facilities that use HWDS	15,664	18,685	18,428	32,803(*)	39,134	44,922
The amount of total hazardous waste (tonnes)	629,933	786,418	938,498	1,373,368	1,413,220	1,357,340

Source: *Ministry of Environment and Urbanisation, General Directorate of the EIA, Permit and Inspection*
Notes: *Mining Industry hazardous waste amount is not included.*
(*) 2013 figures were recalculated after the printing of the 2013 Environmental Indicators Booklet and after the data was updated following entry of the missing declarations.
(**) 2012 data is missing in the table because 2012 hazardous waste statistics bulletin was not published.
(***) In the statistics bulletins for 2013, 2014 and 2015, amount processed within the facility was reported under either disposal or recoveryg accordingly.

Number of hazardous waste recovery facilities has increased from 185 in 2010 to 378 in 2015. Number of landfills for hazardous waste is 8 in 2015, while this number was 2 in 2010.

There are 44 plants for energy recovery from waste, 5 of these are incineration plants and 39 of them are co-incineration plants. At these facilities, 590 thousand tons of waste have been co-incinerated as auxiliary fuel and 780 thousand tons of waste have been consumed as alternative raw material.

GRAPH 48- LICENSED WASTE RECOVERY/DISPOSAL FACILITIES



Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

6.4- Medical Waste

D P S I R

7519 plants have sent their notifications in the Hazardous Waste Declaration System (HWDS) for the year 2015. The declared total amount of medical waste is 81,016 tons. This figure represents 6% of the total amount of hazardous waste (excluding mining waste).

The sterilization facilities that have been established since 2008 in Turkey have been successfully sterilizing medical waste. As of the end of 2015, 52 sterilization facilities have given services to 79 provinces in our country. In addition, there are 2 incineration plants where medical waste is also incinerated. Medical waste from 81 provinces are managed in a safe manner in established facilities.

TABLE 22- ACCORDING TO THE HAZARDOUS WASTE DECLARATION SYSTEM (HWDS) DATA MEDICAL WASTE (2013- 2015)

YEARS	2013	2014	2015
The number of firms	4949	7059	7519
The amount of total medical waste (tonnes)	71,173	83,190	81,016

Source: Ministry of Environment and Urbanisation, General Directorate of the EIA, Permit and Inspection According to The Hazardous Waste Declaration System (HWDS) Datas

6.5- Waste Oils, Vegetable Waste Oils, Waste Batteries And Accumulators, Waste Electrical And Electronic Equipment (WEEE), End of Life Tires

D P S I R

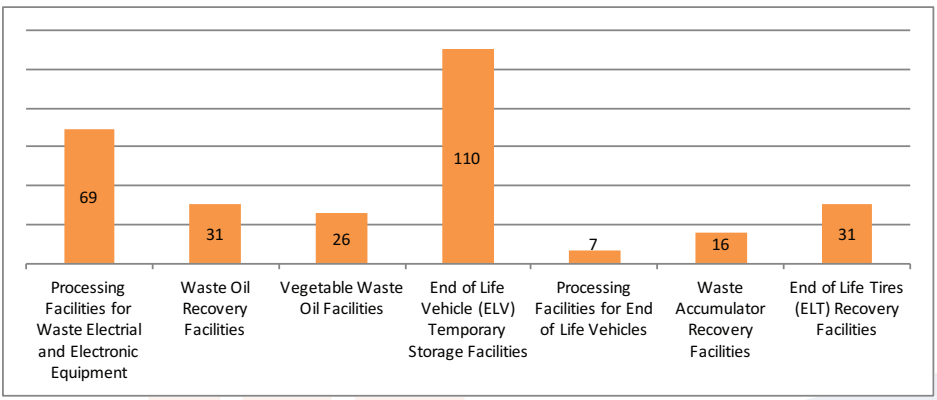
Waste oil, vegetable waste oils, waste accumulators, waste batteries, end of life tires, end of life vehicles and waste electrical and electronic equipment quantities in the years 2013, 2014 and 2015 are given in Table 23.

TABLE 23- WASTE OILS, VEGETABLE WASTE OILS, WASTE BATTERIES AND ACCUMULATORS, WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE), END OF LIFE TIRES (TONNES) (2013-2015)

YEARS	2013	2014	2015
Waste Oils	39,645	47,460	57,800
Vegetable Waste Oils	14,350	15,200	21,040
Waste Batteries	526	555	630
Waste Accumulators	69,000	61,300	71,432
Waste Electrical and Electronic Equipment (WEEE)	9,500	22,000	28,000
End of Life Tires	118,600	120,425	134,680

Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

GRAPH 49- NUMBER OF LICENSES and TEMPORARY OPERATION CERTIFICATES in 2015



Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

6.6- End of Life Vehicles

D P S I R

In 2015, 19,994,472 vehicles were circulating in traffic. However, some of these are taken out of the traffic due to various reasons, and some became scrap. M1 (motor vehicles with maximum capacity of 8 persons excluding the driver, and for passenger transportation only) and N1 (with a maximum weight of 3500 kg and designed to carry load) categorized under By-Law on Control of the End of Life Vehicles are scrapped.

According to 2015 data, the records of approximately 14% of 108,030 vehicles (15,661 vehicles) within the M1 and N1 categories were deleted by the General Directorate of Security and considered as scraps.

TABLE 24

YEARS	2006	2008	2010	2012	2014	2015
a. Total Number of Motor Vehicles in Traffic	12,227,393	13,765,395	15,095,603	17,033,413	18,828,721	19,994,472
b. Number of Motor Vehicles whose Registration was Cancelled	68,177	87,230	151,700	125,407	154,500	108,030
c. Rate of Registration-Cancelled Motor Vehicle to Total number of Motor Vehicle (%) **(bx100/a)**	0.56%	0.63%	1.00%	0.74%	0.82%	0.54%
d. Total Number of Vehicles Scrapped by General Directorate of Security	29,817	50,231	65,502	73,567	98,871	80,612
e. Rate of Scrap Vehicles to Registration-Cancelled Vehicles (%) **(dx100/b)**	44%	58%	43%	59%	64%	75%
f. Number of End of Life Vehicles which are scrapped by General Directorate of Security (vehicles in M1 and N1 category)	11,826	20,170	27,687	19,919	21,173	15,661
g. Rate of End of Life Vehicles which are Scrapped by General Directorate of Security (vehicles in M1 and N1 category) to Vehicles whose Registration was Cancelled (%) **(fx100/b)**	17%	23%	18%	16%	14%	14%

Source: The Ministry of İnterior, General Directorate of Security

6.7- Mining Waste

D P S I R

According to TURKSTAT data, in 2014, mining establishments generated 755 million tonnes of waste, of which 99.7% was mineral waste. 99.7% of mineral waste was pickling material/overburden. 0.3% of the total mining waste in the form of hazardous waste.

When looking at the distribution of total mining waste by recovery and disposal methods in 2014; 73.9% of total waste was disposed of in heaps for overburden or landfill sites, 18.2% was used for backfilling, 6.8% was used for reclamation purposes in mining sites and 1.1% was recovered or disposed of by other methods.

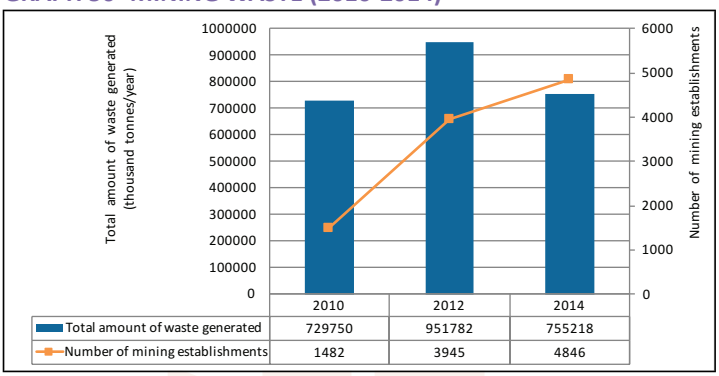
The ratio of the waste recovered and used of the reclamation/rehabilitation of the mining sites was 2.8 % of the total mining waste in 2010, 5.8% in 2012 and 7.5% in 2014 respectively[31].

TABLE 25- NUMBER OF MINING WASTE LANDFILLS

YEARS	2011	2012	2013	2014	2015
MINING WASTE LANDFILLS	6	17	25	32	34

Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

GRAPH 50- MINING WASTE (2010-2014)



Source: TURKSTAT, Mining Establishments Water, Wastewater and Waste Statistics, http://www.turkstat.gov.tr/OncekiHBArama.do

(1) All mining establishments in mining of coal and lignite, mining of metal ores, mining support service activities and establishments having 10 or more employees in other mining and quarrying activities are covered in the scope of the survey in 2010.
(2) The scope of Mining Establishments Water, Wastewater and Waste Statistics survey in 2012 was constituted of mining establishments, which submitted production data for 2011 to General Directorate of Mining Affairs or had a new licence for 2012.
(3) The scope of Mining Establishments Water, Wastewater and Waste Statistics survey in 2014 was mining establishments, which submitted production data for 2013 to General Directorate of Mining Affairs or had a new licence for 2014.

6.8- Packaging Waste

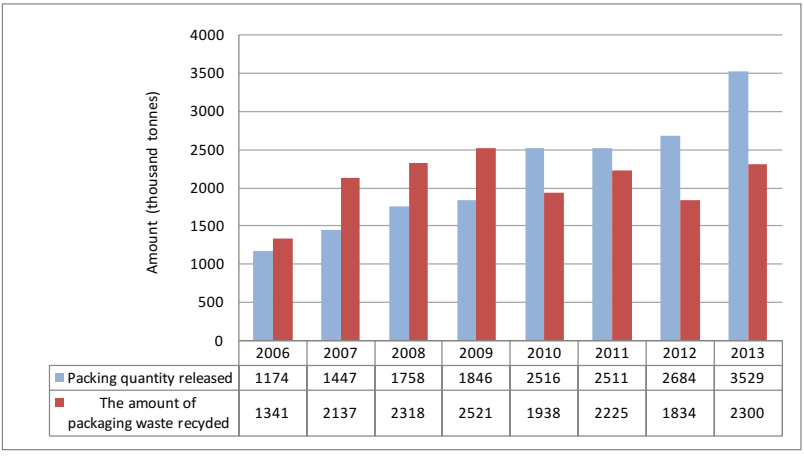
D P S I R

Generally, packaging waste constitutes 30% by weight and 50% by volume of all waste.

In accordance with the polluter-pays principle of By-Law on Packaging Waste Control; the responsibility of meeting the costs of collection of packaging waste is given to the businesses that release their products with packaging.

Thus, keeping a registry of packaging waste producers is of great importance.

GRAPH 51- PACKAGING QUANTITY RELEASED AND RECOVERED AMOUNT OF PACKAGING WASTE THROUGH THE PACKAGING WASTE DECLARATION SYSTEM OVER THE YEARS



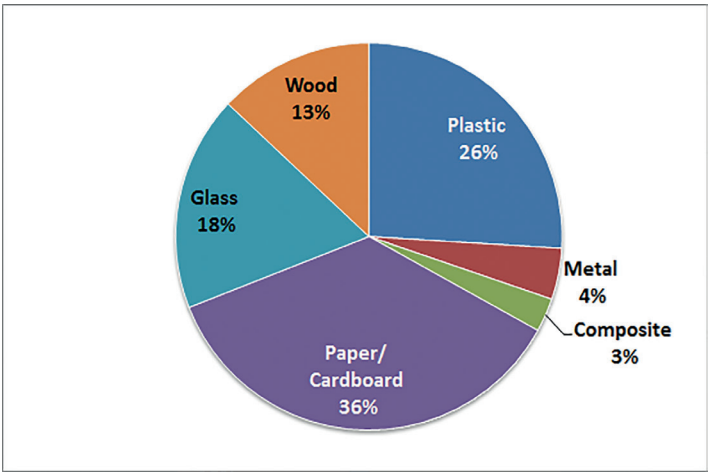
	2006	2007	2008	2009	2010	2011	2012	2013
Packing quantity released	1174	1447	1758	1846	2516	2511	2684	3529
The amount of packaging waste recyded	1341	2137	2318	2521	1938	2225	1834	2300

Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

TABLE 26- STATISTICAL RESULTS OF PRODUCED, RELEASED PACKAGING AND THE PACKAGING WASTE IN 2013

Type of Packaging	Produced Packaging Amount (ton)	Packaging Quantity Released (ton)	Recovered Amount (ton)	Achieved Recovery Amount (%)
PLASTIC	1,566,809	904,579	472,890	52
METAL	279,177	156,879	82,187	52
COMPOSITE	148,184	97,904	71,524	73
PAPER/ CARDBOARD	2,358,591	1,271,906	1,429,091	112
GLASS	899,596	641,520	183,053	29
WOOD	655,477	456,057	61,600	14
TOTAL	**5,907,834**	**3,528,845**	**2,300,345**	**65**

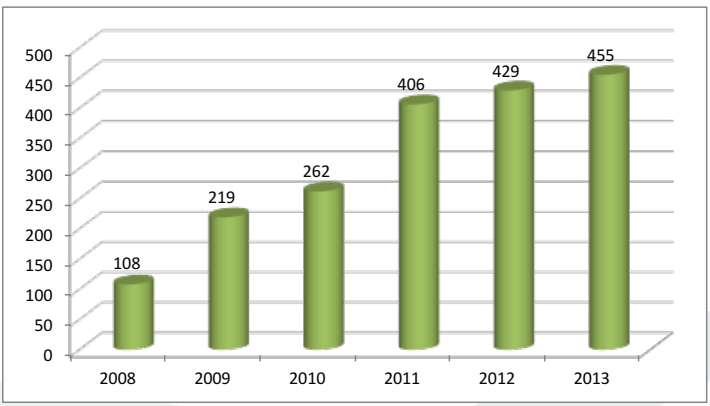
GRAPH 52- THE RATE OF PACKAGING QUANTITY RELEASED ACCORDING TO TYPE AND INTENDED USE IN 2013



Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

Municipalities are obliged to collect or to have packaging waste collected according to the By-Law. They prepare packaging waste management plans including collection and transport activities of the packaging waste separately from other wastes at the source of the waste in order to indicate how, when, at what time, and who will do these studies. Then, packaging waste management plans are submitted to the Ministry. These studies started for the first time in 2008 and are still continuing.

GRAPH 53 – NUMBER OF MUNICIPALITIES WHO HAVE APPROPRIATE PACKAGING WASTE MANAGEMENT PLANS



Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

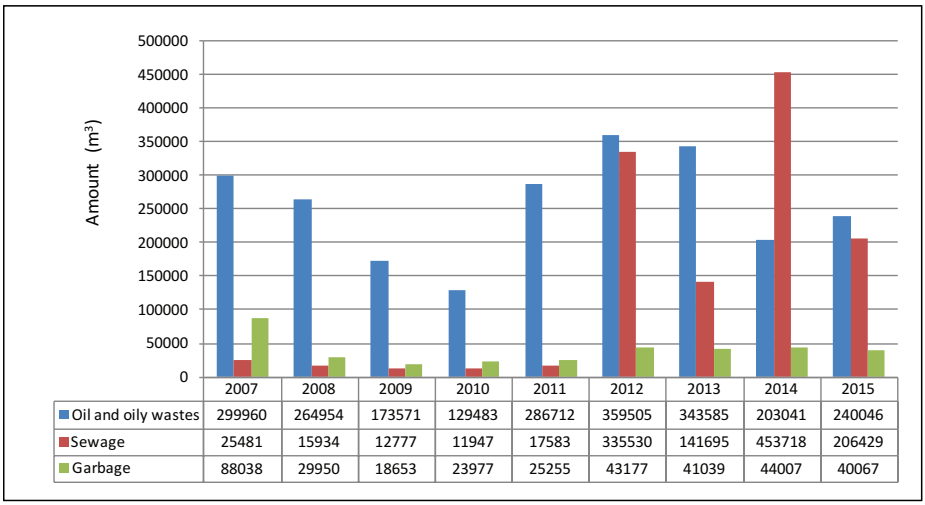
6.9- Amount of Ship Waste

As a requirement of International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which Turkey is also a party and the national legislation namely By-Law on "Waste Reception from Ships and Control of Waste" (Official Journal No: 27061 issued 26 December 2004); waste receiving facilities have been founded and operated

by the institutions in order to prevent the ships from dumping their waste and residues into the oceans and territorial waters of Turkey and to protect the marine areas.

While the number of the licensed waste receiving facilities that serve for receiving waste from the vessels in the ports was 18 in 2005, this figure reached to 269 in the end of 2015.

GRAPH 54- DISTRIBUTION OF WASTE ORIGINATED FROM SHIPS OVER THE YEARS (m^3)



	2007	2008	2009	2010	2011	2012	2013	2014	2015
Oil and oily wastes	299960	264954	173571	129483	286712	359505	343585	203041	240046
Sewage	25481	15934	12777	11947	17583	335530	141695	453718	206429
Garbage	88038	29950	18653	23977	25255	43177	41039	44007	40067

Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

The oily waste collected in these facilities in ports is used as additional fuel in the licensed installations providing the required criteria as in the EU countries. In this way, the ship sourced pollution caused by the increasing sea traffic is decreased.

7.1- General Distribution of Land Cover

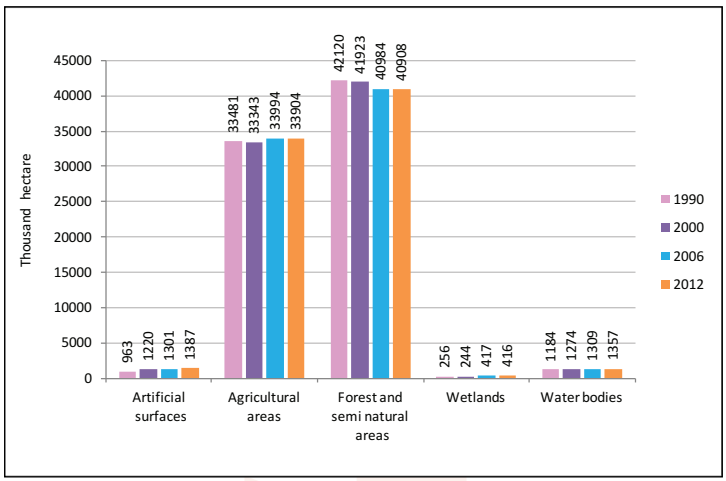
D P S I R

This indicator is a state indicator. It is very important for land use planning purposes to know the diversity of plantation areas clearly to observe the current and possible improvements in the area and to assess and limit the pressures on land by urbanisation and industrialisation purposes.

Under the European Union's CORINE (Coordination of Information on the Environment) Land Cover Program, projects have been run in years 1990, 2000, 2006 and 2012 in Turkey.

According to the CORINE 2012 data, ratios of artificial areas account for 1.78% of Turkey, whereas agricultural areas account for 43.48%, forest and semi-natural areas for 52.46%, wetlands for 0.53% and water bodies cover 1.74% of the country.

GRAPH 55- LAND USE BY YEARS (1990-2012)



Source: Ministry of Forestry and Water Affairs, IT Department Directorate

In Turkey between 1990 and 2012, while forests and semi-natural areas decreased by 1,212,900 ha, all other areas have increased, such as artificial surfaces by 424,867 ha, agricultural areas by 423,756 ha, water bodies by 173,305 ha and wetlands by 159,604 ha. Increasing population, urbanisation and industrialization posed threat to natural and agricultural areas.

When the rate of land use in Europe is considered, according to CORINE 2006 data (including Turkey), ratios of forests account for 35%, arable lands for 25%, pastures for 17%, semi-natural flora for 8%, water bodies for 3%, wetlands for 2%, and artificial areas (urbanized) for 4% [33].

7.2- Misuse of Agricultural Areas

D P S I R

This is a pressure indicator. Increasing population, urbanisation and industrialization poses pressure on agricultural land.

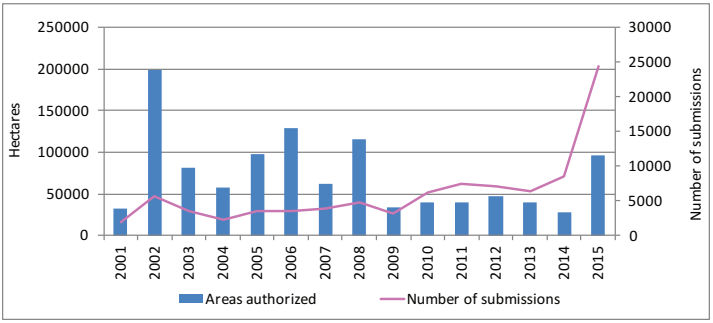
In the 1989-2015 period, a total of 2,553,316 hectares of agricultural land was allowed to be used for non-agricultural activity in Turkey.

629,285 hectares of agricultural land was allowed for non-agricultural use in 2006-2015 period. 65.4% of this land was dry marginal agricultural land and 22.9% was absolute agricultural land [35].

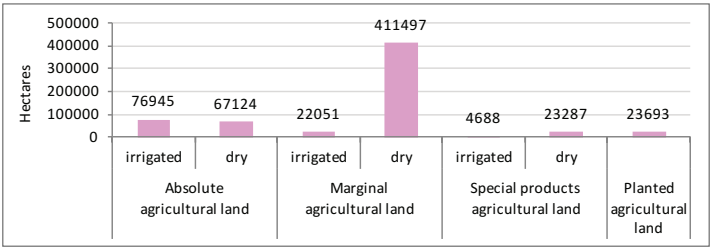
In 2015, 24,421 applications for non-agricultural use have been made and in total 96,255 ha of agriculture land was permitted to be used as non-agricultural area.

According to the Soil Protection and Land Use Law number 5403, irrigated farming and fertile agricultural lands should be conserved and unless absolutely necessary, apart from marginal ones these lands cannot be used for construction.

GRAPH 56- MISUSE OF AGRICULTURAL AREAS WITHIN THE SCOPE OF SOIL CONSERVATION AND LAND USE LAW NO 5403 (2001-2015)



GRAPH 57- DISTRIBUTION OF THE LAND ALLOWED FOR MISUSE ACCORDING TO THEIR CLASSES IN THE 2006-2015 PERIOD



Source: http://www.tarim.gov.tr/sgb/Belgeler/SagMenuVeriler/TRGM.pdf

7.3- Zones Under Threat of Erosion

D P S I R

The indicator is a status indicator representing the areas exposed to erosion and the degree of erosion.

Turkey's geographical position, climate, topography and soil conditions are the main factors which affect the deterioration of the land and increase the sensitivity of drought. There are various erosion types observed all over the country; while water erosion is the most widespread one. 61.2% of the country territory faces severe and very severe water erosion problem.

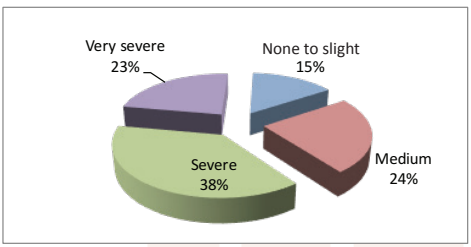
Given below is the erosion information from the Digital Soil Maps (scale 1/25,000) that have been prepared by GIS systems and classified according to the American Taxonomy, relying on field surveys of Repealed General Directorate of Rural Services (soil survey and mapping data 1982-1984).

TABLE 27- AREAS THAT WIND AND WATER EROSION OCCUR AND THEIR DEGREES

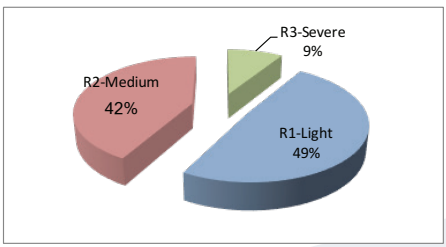
	MAGNITUDE OF EROSION	AREA (ha)
Water Erosion	1-None to slight	10,930,800
	2-Intermediate	17,754,275
	3-Severe	28,410,874
	4-Splitting (Very severe)	16,856,271
Wind Erosion	R1-Light	233,730
	R2-Medium	198,720
	R3-Severe	42,020

Source: Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Reform

GRAPH 58- WATER EROSION



GRAPH 59- WIND EROSION



Source: Ministry of Food, Agriculture and Livestock, General Directorate of Agricultural Reform

8.1- Total Number of Species, Endangered Species, Endemism Rate (%)

D P S I R

This is an impact indicator. Impact of human activities is related to the biological diversity.

Turkey is an interception zone of Mediterranean and Near East botanic diversity and origin centres; also an origin source for the genetic diversity centres of several cultivated plants.

TABLE 28- NUMBER OF TAXONS BELONGING TO DIFFERENT TYPES OF SPECIES AND SUBSPECIES, STATE OF ENDEMISM, RARE AND ENDANGERED SPECIES AND EXTINCT SPECIES

Plant Groups	Identified Species/ Subspecies	Endemic Species	Endangered and Rare Species	Extinct Species
Algae	2150	-	unknown	unknown
Lichen	1000	-	unknown	unknown
Bryophytes	910	2	2	unknown
Sword ferns	101	3	1	unknown
Gymnosperms	35	5	1	unknown
Monocotyledons	1765	420	180	-
Cotyledons	9100	3500	1100	11

Source: National Biological Diversity Strategy and Action Plan 2007

Turkey has a unique location for plant species especially seed plants, considering its climatic zone. The rate of endemism is very high in Angiosperm which belongs to flowering plant groups. Of the level of species and subspecies, there are nearly 11,000 flowering plant types, 3,925 of which are endemic, and the endemism rate is nearly 34%.

Among the seedless plants, most renowned plant group is the ferns (Pteridophtyes). The number of bostfern in species and subspecies in Turkey are 101 and only 3 of them are endemic [37].

Turkey is a very rich country in terms of endemic plants; however, these endemic species are under serious threats. According to the criteria of IUCN, 2001, approximately 600 of our endemic species are in the category of “seriously endangered-CR” and 700 of them are categorised as “endangered-EN”

TABLE 29- NUMBER OF TAXONS BELONGING TO DIFFERENT TYPES OF ANIMAL SPECIES AND SUBSPECIES, STATE OF ENDEMISM, NUMBER OF RARE AND ENDANGERED SPECIES, AND EXTINCT SPECIES

Animal Groups	Defined Species	Endemic Species/ Subspecies Variety	Rare/ Endangered Species	Extinct Species
VERTEBRATES				
Reptiles/ Amphibian	141	16	10	-
Birds	460		17	-
Mammals	161	37	23	4
Freshwater Fishes	236	70	-	4
Marine Fishes	480	-	-	-
INVERTEBRATES				
Molluscs	522	203	unknown	unknown
Butterflies	6500	89	89	unknown
Locusts	600	270	-	-
Damselflies	114	-	-	-
Coleoptera	~10000	~3,000	-	-
Hemiptera	~1400	~200	-	-
Homoptera	~1500	~200	-	-

Source: National biodiversity strategy and action plan 2007

Turkey is also rich and interesting for fauna, regarding its location. 460 bird, 161 mammal, 141 reptile, 480 sea fish and 236 freshwater fish species have been identified in the country.

Among 141 reptile and amphibian species of Turkey, 16 are endemic, of which 10 are threatened. No bird species has been identified as endemic. However, 5 species and 32 subspecies of mammals, 16 species/subspecies of reptiles and 70 species/sub-species of fish are endemic.

Although invertebrate fauna is not studied as much as vertebrates, 30,000 species have been identified while total number of species is estimated to be 60,000-80,000.

There are 10 sea mammal species spotted in Turkey maritime zones. While 21 sea mammal species either live in or periodically visit the Mediterranean sea, only 3 species live in the Black Sea. It has been reported that the Mediterranean seal (monachus monachus) has not been spoted in the Black Sea since 1994 [38].

Numbers of bio-smuggling cases recorded between 2007 and 2015 within the combat against bio-smuggling is as follows.

TABLE 30- NUMBER OF BIO-SMUGGLING CASES RECORDED (2007-2015)

YEARS	Number of bio-smuggling cases
2007	2
2008	2
2009	2
2010	9
2011	21
2012	11
2013	2
2014	3
2015	7

Source: http://www.milliparklar.gov.tr/Anasayfa/istatistik?sflang=tr

8.2- Number of Invasive Alien Species

The indicator is a pressure indicator since invasive alien species poses threat on indigenous species and habitats.

While the number of invasive alien species in Turkish seas was 263 in 2005, this number increased to 422 in 2011 and approached to 475 in 2015 [36].

While most of the invasive species in the Mediterranean sea come through the Suez Canal, most of those in Black Sea are transported to the Black Sea via the ballast waters of vessels [38].

In the inland waters, 25 invasive alien species have been identified as of 2015 [36].

8.3- Designated Protected Areas

Indicator is a response indicator. Designating protected areas aim to conserve biodiversity and natural resources.

As of 2015, total areas (terrestrial and marine protected area) protected by Ministry of Forestry and Water Affairs and Ministry of Environment and Urbanisation General Directorate for Preservation of Natural Heritage is summed to 8.9% of the total country surface area. The grasslands, drinking water basins and forest areas (total forest, forest soil, pasture, stony zones),

which are allocated as areas of nature conservation as a function were not included in this calculation. There is a drop in the percentage of protected areas from 10.2% in 2013 to 8.6% in 2014, mainly because a registry procedure has been introduced for the wetlands by the By-Law on Wetlands. The percentage of protected area have become 8.9% in 2015.

Referring to the situation in the world, according to 2014 World Bank data; terrestrial and marine protected areas (% of total terrestrial area) were about 12.8%[41].

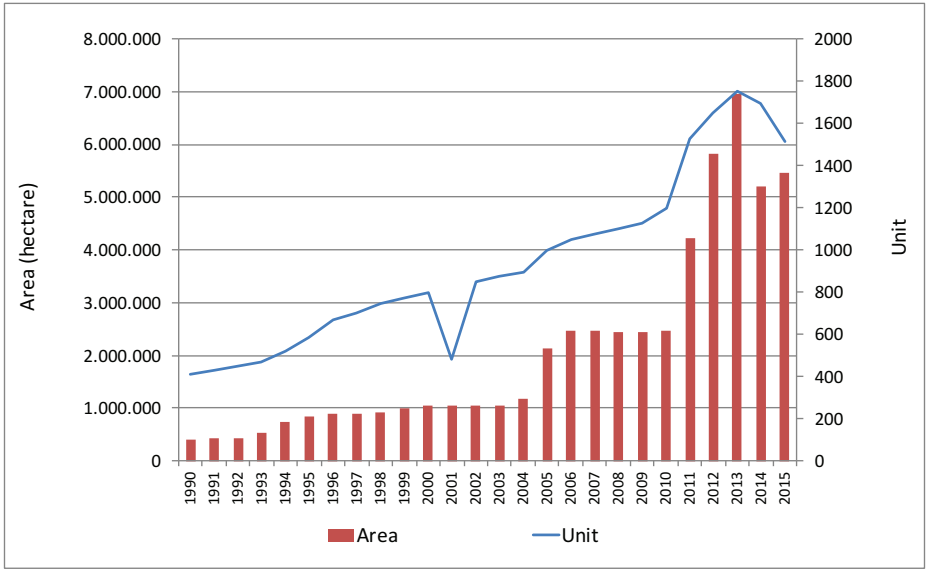
TABLE 31- STATUS AND AREAL DISTRIBUTION OF AREAS UNDER PROTECTION IN TURKEY

YEARS	2013		2014		2015	
The Ministry of Forestry and Water Affairs, Protected Areas	**Number (Quantity)**	**Area (ha)**	**Number (Quantity)**	**Area (ha)**	**Number (Quantity)**	**Area (ha)**
National Park	40	848,119	39	814,762	40	828,614
Nature Park	189	89,832	201	96,963	204	99,394
Nature Monument (1)	112	6,678	112	6,683	112	6,993
Nature Conservation Area (1)	31	63,694	31	64,208	31	64,224
Wildlife Conservation Area	80	1,191,340	81	1,192,794	81	1,192,794
Nationally Registered Wetlands (2)	121	1,735,495			20	278,072
Ramsar Areas (2)	14	184,487	14	184,487	14	184,487
Protection Forests	55	251,409	55	250,317	55	250,033
Gene Conservation Forests	258	37,098	276	40,014	283	38,828
Seed Stands	347	46,106	341	45,232	337	44,664
Seed Orchard	178	1,313	176	1,328	184	1,421
Honey Forest	184	24,309	227	30,140		
City Forest	126	11,867	127	9,946	133	10,315
SUBTOTAL	**1,735**	**4,491,747**	**1,680**	**2,736,874**	**1,494**	**2,999,839**
Ministry of Environment and Urbanisation, Protected Areas	**Number (Quantity)**	**Area (ha)**	**Number (Quantity)**	**Area (ha)**	**Number (Quantity)**	**Area (ha)**
Special Environmental Protection Areas	16	2,459,116	16	2,458,749	16	2,458,749
Natural Sites	1,273	1,322,749	2,430	1,773,856	2,430	1,773,856
SUBTOTAL	**1,289**	**3,781,865**	**2,446**	**4,232,605**	**2,446**	**4,232,605**
OVERALL TOTAL	**3,024**	**8,273,612**	**4,126**	**6,969,479**	**3,940**	**7,232,444**
Ratio of protected areas in the country's total surface area (%) (3)		**10.2%**		**8.6%**		**8.9%**

Sources: *For areas protected by Ministry of Forestry and Water Affairs: http://www.milliparklar.gov.tr/kitap/150/?sflang=tr#p=2 special protection areas and natural sites: General Directorate for Preservation of Natural Heritage*

Notes: *(1) Because of the border change in Nature Conservation Area and Nature Monument, changes have occurred in area size. (2) Registry procedure has been introduced for the wetlands by an amendment in the By-Law on Wetlands. According to the By-Law on Wetlands (Official Journal dated 4 Nisan 2014 and no. 28962), there are 14 registered RAMSAR sites as of December 2014. (3) Surface area for Turkey refers to topographic surface area, which is 814,578 km^2.*

GRAPH 60- NUMBER AND SIZES OF PROTECTED AREAS (EXCLUDING NATURAL SITES) BY YEARS



Source: *Ministry of Forestry and Water Affairs, General Directorate of Nature Conservation and National Parks, http://www.milliparklar.gov.tr/Anasayfa/istatistik.aspx?sflang=tr;*

Notes: *1) Natural Sites are not included in the data.*
2) Registry procedure has been introduced for the wetlands by the By-Law on Wetlands.

8.4- Length Of Protected Coastal Zones

D P S I R

It's a response indicator.

Coastal zones are more affected by human activities and climate change. Objective is to mitigate the impact and protect biological diversity.

The total coastal length of Turkey is 8592 km (excluding islands) and 1860 km (22%) of it is under protection, as of 2015 [39].

TABLE 32- LENGTH OF PROTECTED COASTAL ZONES IN TURKEY

YEARS	2002	2012	2013	2014	2015
Length of Protected Coastal Zones in Turkey (km)	1775	1853	1855,3	1855,3	1860
Rate of Length of Protected Coastal Zones to Total Length of Coastal Zones (%)	20	22	22	22	22

Source: *Status Report on Nature Conservation (2014-2015), http://www.milliparklar.gov.tr/kitap/150/?sflang=tr#p=8*
Ministry of Forestry and Water Affairs, General Directorate of Nature Conservation and National Park

8.5- Wildlife Protection Activities

D P S I R

This response indicator represents the activities for the protection of biological diversity.

A total of 629 species including 121 mammals, 378 birds and 130 reptiles, are taken under protection by The Ministry of Forestry and Water Affairs General Directorate of Nature Conservation and National Parks.

81 protected wildlife reserves have been established by Decision of Council of Ministers to protect wild animals that are under the danger of extinction, and regular inventories of these species are prepared every year. In these areas, *Chamois*, the Anatolian wild sheep, wild goat, gazelle, red deer, fallow deer, roe deer, great bustard, grouse, black vulture and bold Ibis, hyena and waterfowl species are protected. In order to breed endangered wild animal species, stations where these animals are raised are established and the grown-up animals are released back to nature in appropriate living spaces.

Within the scope of CITES Convention, studies are performed for the prevention of illegal trade of wild animals [36].

TABLE 33- WILDLIFE PROTECTION ACTIVITIES

YEARS	2012	2013	2014	2015
The Number of Wild Mammals, Placed in the Nature	62	84	148	114
Winged Wild Animal Placement Numbers (Partridge – Pheasant)	64,895	79,200	91,050	97,200
Number of Trout Stocked in Waters within Forest Zones,	2,042,000	3,172,000	1,291,000	1,510,000
Total Number of Wildlife Production Facilities (Partridge, Pheasant, Mammals, Bald Ibis, Trout, Mountain Gazelle)	20	21	21	23
The Number of Wild Animals Rehabilitated and Released back to Nature	921	1,643	2,109	2,561

Sources: *http://www.milliparklar.gov.tr/kitap/150/?sflang=tr#p=32*
http://www.milliparklar.gov.tr/Anasayfa/istatistik?sflang=tr

8.6- Regulation and Control of the Trade of Wild Animals According to the International Conventions

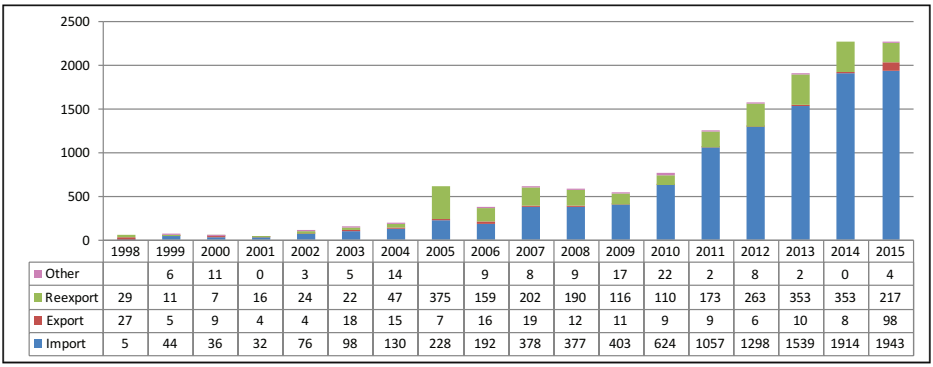
D P S I R

This is a response indicator related with the protection of biological diversity. CITES Convention is the "Convention on International Trade In Endangered Species of Wild Fauna and Flora".

Turkey has been party to the CITES Convention since 1996. By-Law on CITES National Implementation was issued in 2001. Ministry of Forestry and Water Affairs prepares CITES Documents for live, death, parts or derivatives of wild animals like birds, reptiles, mammals (excluding marine mammals), amphibians and arthropods and forestry products within the scope of the CITES Convention. The Ministry also carries out tasks such as coordination, reporting, training. Due to her successful efforts Turkey is considered to be in Category A (Category I). Also for the species not covered by CITES annexes, certifications on the export/import suitability are being issued.

In 2015 a total of 2262 certification documents were issued.

GRAPH 61- NUMBER OF CITES CONSENT CERTIFICATES BY THE DOCUMENT TYPE, (1998-2015)



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Other		6	11	0	3	5	14		9	8	9	17	22	2	8	2	0	4
Reexport	29	11	7	16	24	22	47	375	159	202	190	116	110	173	263	353	353	217
Export	27	5	9	4	4	18	15	7	16	19	12	11	9	9	6	10	8	98
Import	5	44	36	32	76	98	130	228	192	378	377	403	624	1057	1298	1539	1914	1943

Source: http://www.milliparklar.gov.tr/Anasayfa/istatistik?sflang=tr

8.7- The Distribution of the Forest Areas

D P S I R

This state indicator describes the cumulative size of forest areas.

In 2015, total size of forests in Turkey was 22,342,935 hectares which constitutes 28.6% of the country's total surface area. Out of Turkey's forestland, 12,704 thousand hectare area is normal forest (productive) area (Tree crown cover is 11-100%), 9,639 thousand hectares are degraded areas (Tree crown cover is less than 10%). Thus, 57% of the forest land is productive while 43%

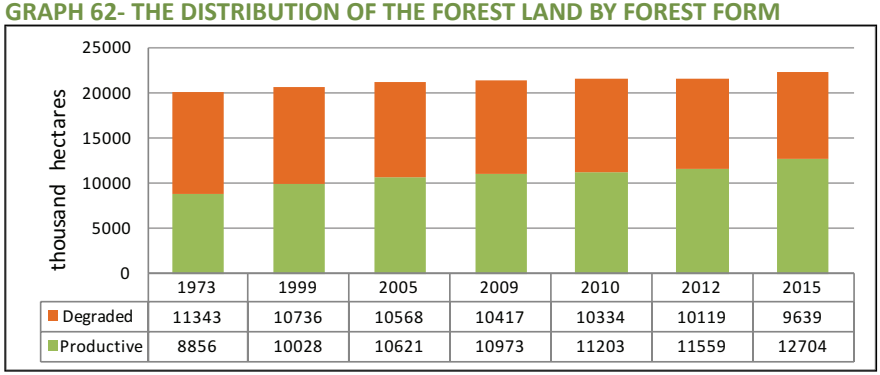
is degraded. Between 1973 and 2015, the forest land in Turkey increased by 2,144 thousand hectares [42].

As of 2015, Turkey's forest tree growing stock was 1,611,774 thousand m³. 95% of this land is closed cover while 5% is degraded. Between 1973 and 2015 country forest tree growing stock of the country has increased by 676,262 thousand m³.

The ratio of Turkey's forest areas to the country's surface area has increased from 26.7% in 1999 to 28.6% in 2015.

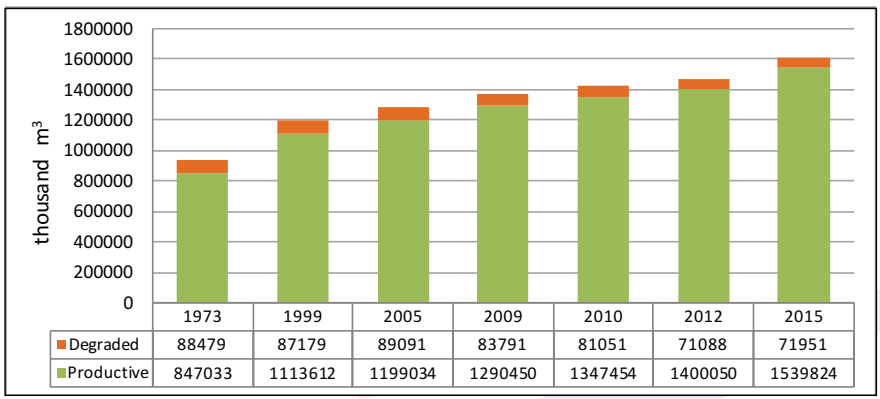
According to the World Bank, the ratio of world's forest area to the total land area was 30.8% in 2000 and 31.3% in 2015 [44].

GRAPH 62- THE DISTRIBUTION OF THE FOREST LAND BY FOREST FORM



	1973	1999	2005	2009	2010	2012	2015
Degraded	11343	10736	10568	10417	10334	10119	9639
Productive	8856	10028	10621	10973	11203	11559	12704

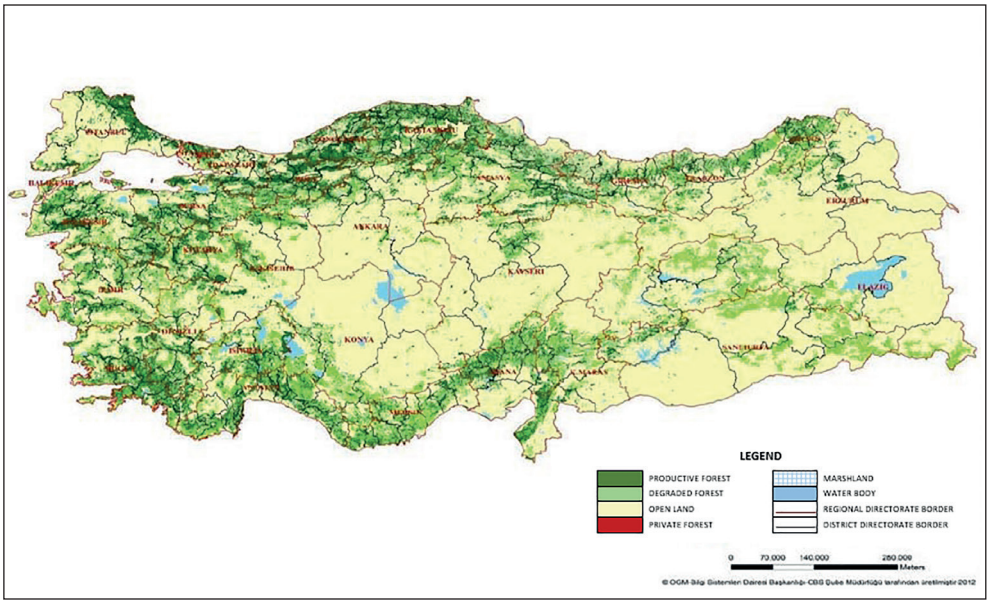
GRAPH 63- DISTRIBUTION OF GROWING STOCK BY FOREST FORM



	1973	1999	2005	2009	2010	2012	2015
Degraded	88479	87179	89091	83791	81051	71088	71951
Productive	847033	1113612	1199034	1290450	1347454	1400050	1539824

Source: Ministry of Forestry and Water Affairs, General Directorate of Forestry
http://www.ogm.gov.tr/ekutuphane/Sayfalar/Istatistikler.aspx

TURKEY FOREST AREAS (2015)



TABLO 34- ANNUAL FOREST AREA

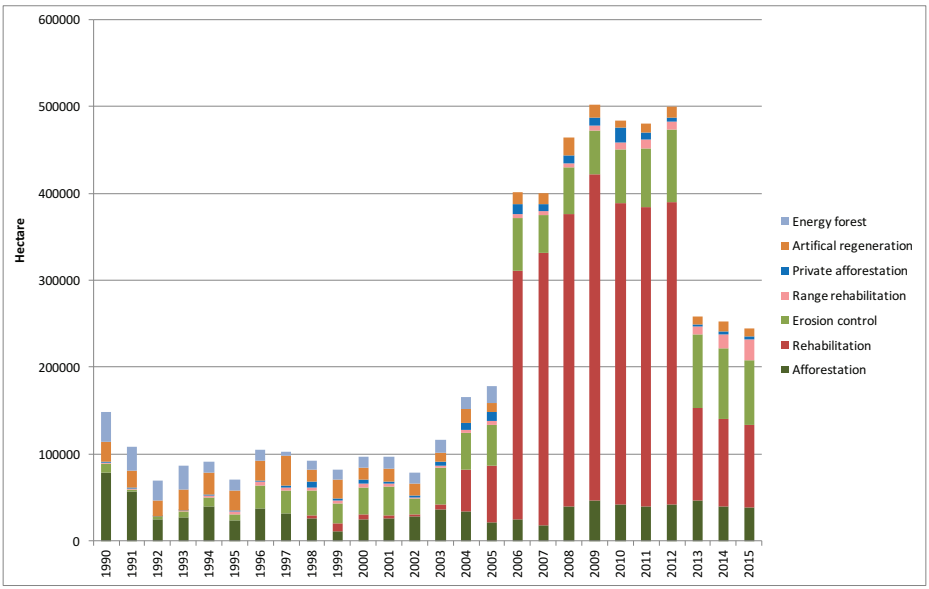
YEARS	1973	1999	2005	2009	2010	2012	2015
Forest Area (hectare)	20,199,296	20,763,248	21,188,747	21,389,783	21,537,091	21,678,134	22,342,935

Source: *Ministry of Forestry and Water Affairs, General Directorate of Forestry. http://www.ogm.gov.tr/ekutuphane/Sayfalar/Istatistikler.aspx*

Note: *these areas which are considered as forests do not include the wooded areas (private Kemp, orchards, hazelnut groves, etc.) but cover natural, seeded or planted forest areas*

43% of the forests in Turkey are degraded and inefficient. It is crucial to rehabilitate inefficient forest lands and convert these areas into productive areas. Rehabilitation studies have been more intensive between 2006 and 2012. In 2015, 38,986 ha area was afforested, 94,411 ha area was rehabilitated, in 75,139 ha area erosion was controlled, in 23,843 ha area range rehabilitation has been done, in 3,012 ha area private afforestation were done and in 9,197 ha area artificial regeneration was done as forest establishment activities. A total of 244,588 hectares of forest establishment activities were conducted in 2015.

GRAPH 64- (1990-2015) FOREST ESTABLISHMENT ACTIVITIES (ha)



Not: *Forest based works are the Works performed by Ministry of Forestry and Water Affairs and the other institutions.*

Source: *Ministry of Forestry and Water Affairs, General Directorate of Forestry, http://www.ogm.gov.tr/ekutuphane/Sayfalar/Istatistikler.aspx*

8.8- Distribution of Forests by Tree Species

Diversity of tree species is a positive indicator of biodiversity. In 2015, Turkey's total forest areas consists of Turkish pine 26.3%, 25.1% oak, crimean pine 19%.

TABLE 35- TOTAL FOREST AREA BY TREE BY TREE SPECIES

TREE TYPE GROUPS	FOREST FORM (hectare)			% rate
	Productive	Degraded	Total	
Turkishpine(pinusbrutia)	2,382,933	3,503,262	5,886,195	26.3
Oak(Quercussp)	3,451,269	2,158,946	5,610,215	25.1
Crimaenpine(pinusnigra)	2,727,524	1,517,397	4,244,921	19.0
Beech(fagusorientalis)	1,630,196	269,733	1,899,929	8.5
Scotspine(pinussyl-vestris)	882,231	636,698	1,518,929	6.8
Fir	218,303	740,120	958,423	4.3
Juniper(Juniperus)	383,422	201,359	584,781	2.6
Cedar	247,162	235,229	482,391	2.2
Spruce	229,191	93,666	322,857	1.4
Alder	128,721	33,250	161,971	0.7
Chestnut	113,161	33,569	146,730	0.7
Stonepine	68,229	20,214	88,443	0.4
Hornbeam	28,252	6,737	34,989	0.2
Limetree	6,445	9,843	16,288	0.1
Ashtree	10,408	2,166	12,574	0.1
Poplar	6,707	505	7,212	0.0
Eucalyptus	1,353	51	1,404	0.0
Otherspecies (*)	188,641	176,042	364,683	1.6
TOTAL	**12,704,148**	**9,638,787**	**22,342,935**	**100.0**

(*) Other species, cypress, Aleppo pine, maritime pines, radiata pine, black locust, sycamore, walnut, with the name of frankincense includes many species not mentioned.

Source: Ministry of Forestry and Water Affairs, General Directorate of Forestry, Turkey Forest -2015, http://www.ogm.gov.tr/ekutuphane/Yayinlar/T%C3%BCrkiye%20Orman%20Varl%C4%B1%C4%9F%C4%B1-2015.pdf

8.9- Functional Forestry

Today, forests are planned with ecosystem-based functional planning approach on multi-beneficial basis. According to the data of this plan, 50% of the forests have economical, 42% have ecological and 8% have social and cultural functions.

TABLE 36- THE DISTRIBUTION OF THE PRIMARY FUNCTIONS OF THE FORESTS

MAIN FUNCTIONS	FORESTED AREA (hectare)			% rate
	Productive	Degraded	TOTAL	
1– Economic Function	7,411,790	3,831,304	11,243,094	50
2– Ecologic Function	4,192,532	5,095,315	9,287,847	42
3– Social and Cultural Function	1,099,826	712,168	1,811,994	8
TOTAL	**12,704,148**	**9,638,787**	**22,342,935**	**100**

Source: Ministry of Forestry and Water Affairs, General Directorate of Forestry Turkey Forest -2015, http://www.ogm.gov.tr/ekutuphane/Yayinlar/T%C3%BCrkiye%20Orman%20Varl%C4%B1%C4%9F%C4%B1-2015.pdf

9.1- Highway - Railway Network Intensity

D P S I R

The road network intensity gives information about the fragmentation and decay of wild life habitats and natural landscape because of active transportation. Other important factors are environmental risks such as traffic related pollution and noise. In this respect, the indicator is a pressure indicator.

In 2015, there were 55 airports open to commercial air traffic, 112 ports and 80 installations handling oil and chemicals in Turkey. The length of highways summed up to 66,437 km, the railway network was 12,532 km in length.

TABLE 37- HIGHWAY AND RAILWAY NETWORKS BY YEARS

YEARS	2003	2004	2005	2006	2007	2008
Highway Network Length (km)	63,244	63,476	63,606	63,672	63,820	63,945
Railway Network Length (km)	10,959	10,968	10,973	10,984	10,991	11,005

YEARS	2009	2010	2011	2012	2013	2014	2015
Highway Network Length (km)	64,255	64,865	65,166	65,491	65,740	65,909	66,437
Railway Network Length (km)	11,405	11,940	12,000	12,008	12,097	12,485	12,532

Source: Ministry of Transport, Maritime Affairs and Communications, http://www.kgm.gov.tr/SiteCollectionDocuments/KGMdocuments/Istatistikler/DevletIlYolEnvanter/SatihYolAgiUzunlugu.pdf

Compared to roads, railways release less greenhouse gas to the atmosphere as they consume energy more efficiently. In addition, less land is used for the construction of railways, thus this plays a significant role in the preservation of the natural environment. Besides, railways help reduce respiratory defficiencies and other illnesses caused by air pollution.

According to the 2014 data, there were 90 km highways and 13 km railways (length of mainline) per population of 100,000. In the EU-28 countries, these figures are respectively, 390 km and 44 km in average. Considering the surface area, there were 84 km highways and 13 km railways per 1000 km² in Turkey. In the EU-28 countries, these figures were 447 km and 50 km respectively [45].

It is estimated that highway network will have reached to 70,000 km and railway network to 25,000 km in length by 2023 [46]. Therefore, it is estimated that highway network intensity will have reached to 86 km and railway network to 32 km per 1000 km².

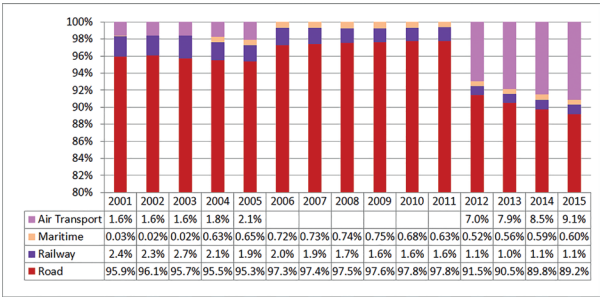
9.2- Amount of Passengers and Freight Carried by Transport Types

D P S I R

This indicator is a driving force indicator and it takes part on transport related environmental impacts. In 2000 domestic passenger transport, the share of the air transport was 1.8% which rose to 9.1% in 2015, whereas in the same period, the proportion of highway transport was reduced from 95.9% to 89.2%, of the railway transport was reduced from 2.2% to 1.1%.The share of maritime passenger transport was 0.6% in 2015. In 2015, considering the domestic freight transport it seems that the highways (89.8%) are the primary option. Share of domestic passenger transport by road is targeted to reduce to 76% at the end of 2023 [46].

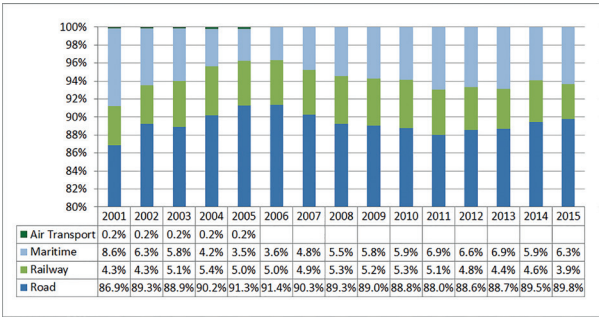
In 2015, shares of railway and highway transport were reduced, whereas the air transport increased in comparison to 2000.

GRAPH 65- DOMESTIC PASSENGER TRANSPORT RATES (percent on passenger-km)*



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Air Transport	1.6%	1.6%	1.6%	1.8%	2.1%							7.0%	7.9%	8.5%	9.1%
Maritime	0.03%	0.02%	0.02%	0.63%	0.65%	0.72%	0.73%	0.74%	0.75%	0.68%	0.63%	0.52%	0.56%	0.59%	0.60%
Railway	2.4%	2.3%	2.7%	2.1%	1.9%	2.0%	1.9%	1.7%	1.6%	1.6%	1.6%	1.1%	1.0%	1.1%	1.1%
Road	95.9%	96.1%	95.7%	95.5%	95.3%	97.3%	97.4%	97.5%	97.6%	97.8%	97.8%	91.5%	90.5%	89.8%	89.2%

GRAPH 66- DOMESTIC FREIGHT RATES (percent on ton-km)**



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Air Transport	0.2%	0.2%	0.2%	0.2%	0.2%										
Maritime	8.6%	6.3%	5.8%	4.2%	3.5%	3.6%	4.8%	5.5%	5.8%	5.9%	6.9%	6.6%	6.9%	5.9%	6.3%
Railway	4.3%	4.3%	5.1%	5.4%	5.0%	5.0%	4.9%	5.3%	5.2%	5.3%	5.1%	4.8%	4.4%	4.6%	3.9%
Road	86.9%	89.3%	88.9%	90.2%	91.3%	91.4%	90.3%	89.3%	89.0%	88.8%	88.0%	88.6%	88.7%	89.5%	89.8%

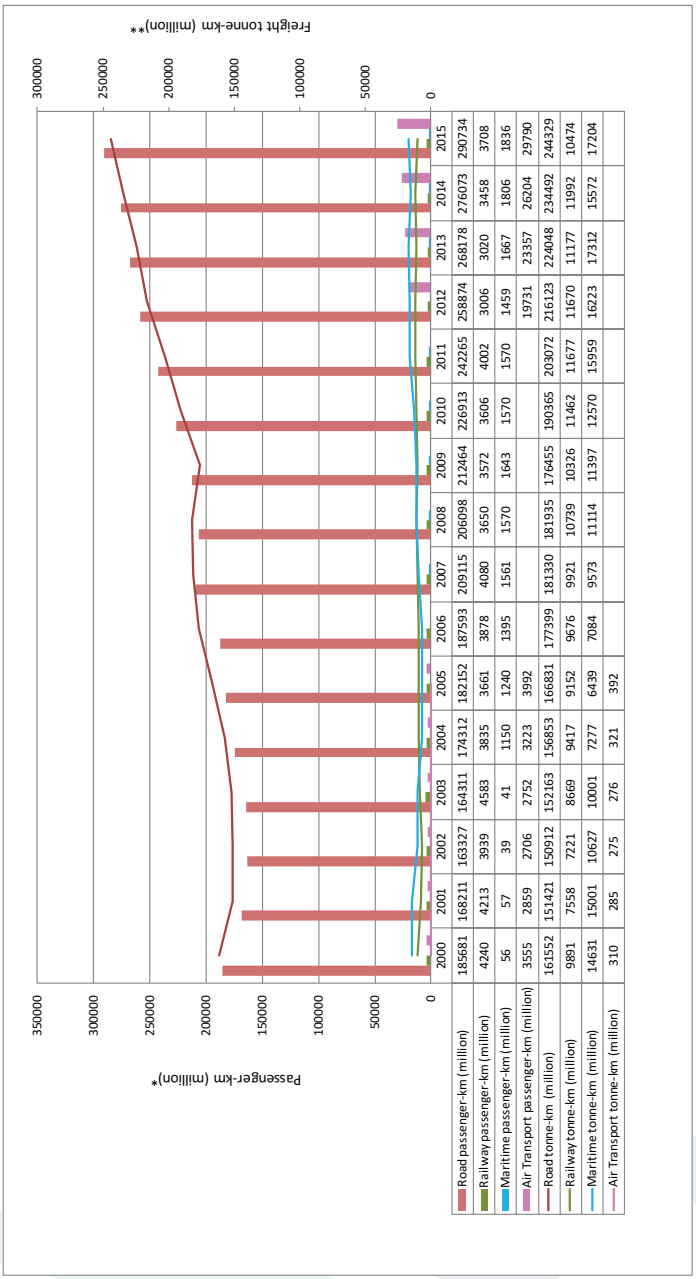
Sources: *Ministry of Transport, Maritime Affairs and Communications, Turkish State Railways*

Notes: *1) Urban transport is not included. 2) Data on passenger and freight transport over the road network of Directorate General for State Highways were taken. 3) Data on passenger and freight transport of the General Drectorate of State Railways were taken.Urban and suburban passenger transport data was exempted.4) Data for the domestic passenger and freight transport were considered. For the empty cells there is no data.. 5) Data on maritime passenger and freight transport on exclusive maritime lineswere taken from the General directorate for Maritime Trade. Units were converted from mile to km.*

** Passenger/Km: Unit of traffic measurement obtained from the transportation of one passenger over one kilometre.*

***Tonne/Km: Unit of traffic measurement obtained from the transportation of one ton of goods over a distance of one kilometre.*

GRAPH 67- DOMESTIC TRANSPORT OF FREIGHT AND PASSENGER ACCORDING TO TRANSPORT PATHS



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Road passenger-km (million)	185681	168211	163327	164311	174312	182152	187593	209115	206098	212464	226913	242265	258874	268178	276073	290734
Railway passenger-km (million)	4240	4213	3939	4583	3835	3661	3878	4080	3650	3572	3606	4002	3006	3020	3458	3708
Maritime passenger-km (million)	56	57	39	41	1150	1240	1395	1561	1570	1643	1570	1570	1459	1667	1806	1836
Air Transport passenger-km (million)	3555	2859	2706	2752	3223	3992							19731	23357	26204	29790
Road tonne-km (million)	161552	151421	150912	152163	156853	166831	177399	181330	181935	176455	190365	203072	216123	224048	234492	244329
Railway tonne-km (million)	9891	7558	7221	8669	9417	9152	9676	9921	10739	10326	11462	11677	11670	11177	11992	10474
Maritime tonne-km (million)	14631	15001	10627	10001	7277	6439	7084	9573	11114	11397	12570	15959	16223	17312	15572	17204
Air Transport tonne-km (million)	310	285	275	276	321	392										

Sources: Ministry of Transport, Maritime Affairs and Communications, Turkish State Railways

Notes: 1) Urban transport is not included. 2) Data on passenger and freight transport over the road network of Directorate General for State Highways were taken. 3) Data on passenger and freight transport of the General Directorate of State Railways were taken.Urban and suburban passenger transport data was exempted.4) Data for the domestic passenger and freight transport were considered. For the empty cells there is no data.. 5) Data on maritime passenger and freight transport on exclusive maritime lineswere taken from the General directorate for Maritime Trade. Units were converted from mile to km.
** Passenger/Km: Unit of traffic measurement obtained from the transportation of one passenger over one kilometre.*
***Tonne/Km: Unit of traffic measurement obtained from the transportation of one ton of goods over a distance of one kilometre.*

9.3- Greenhouse Gases Emissions by Transport Types

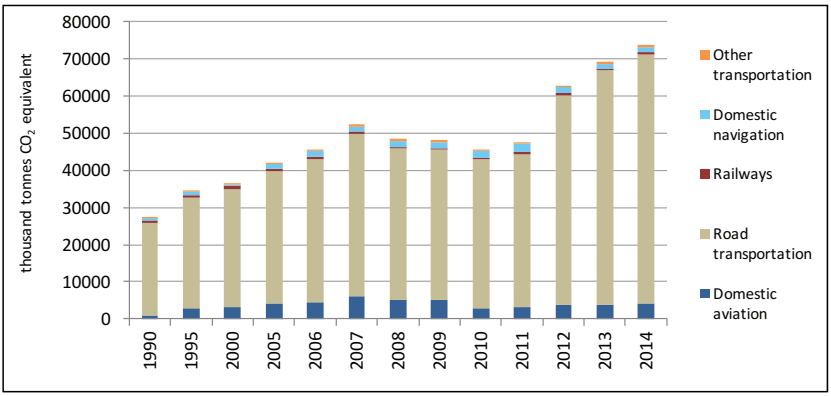
D P S I R

This indicator is a pressure indicator. Contribution of transport to climate change and the distribution of this contribution according to transport modes, are important for the monitoring and control of emissions.

According to the TURKSTAT 2014 greenhouse gas emission inventory data, Turkey's total greenhouse gas emissions are 467,550.4 thousand tonnes CO2 equivalent, in 2014. Out of this, 73,700 thousand tonnes of CO2 equivalent are transport related emissions. The share of transport related emissions in total greenhouse gas emissions was about 13% in 1990 and %16 in 2014.

91% of transport related CO2 emission was originated from road transportation, 5.6% from domestic aviation, 1.9% from domestic navigation, 0.7% from railways and 0.8% from other transport modes.

GRAPH 68- GREENHOUSE GAS EMISSIONS ACCORDING TO TYPE OF TRANSPORT



Source: TURKSTAT

Referring to the situation in the EU 28 countries; In 2013, the transport sector contributed almost one quarter (24.4%) of total EU 28 greenhouse gas emissions. In 2013, emissions from transport (including aviation) were 19.4% above 1990 levels [47].

TABLE 38- GREENHOUSE GAS EMISSIONS ACCORDING TO TYPE OF TRANSPORT

(thousand tonnes CO2 equivalent)

YEARS	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transport	**27,003.7**	**34,152.4**	**36,508.0**	**42,106.0**	**45,492.1**	**52,176.9**	**48,569.2**	**47,983.9**	**45,468.3**	**47,461.0**	**62,632.0**	**68,997.1**	**73.700.0**
Domestic aviation	922.9	2,775.3	3,098.6	4,089.0	4,511.8	6,019.4	5,217.6	5,149.2	2,862.1	3,343.8	3,727.2	3,754.4	4,090.0
Road transportation	24,808.1	29,792.9	31,881.5	35,574.7	38,417.9	43,731.2	40,611.1	40,254.9	39,992.9	40,952.0	56,393.1	62,985.5	67,069.6
Railways	721.9	769.5	714.2	758.7	762.3	470.5	499.8	485.0	517.5	533.1	493.3	505.9	562.5
Domestic navigation	509.2	727.0	623.9	1,301.1	1,465.7	1,600.1	1,545.2	1,635.5	1,684.9	2,245.6	1,617.2	1,155.7	1,350.1
Other transportation	41.5	87.8	189.7	382.5	334.4	355.8	695.5	459.4	410.8	386.5	401.2	595.7	627.8

Source: TURKSTAT

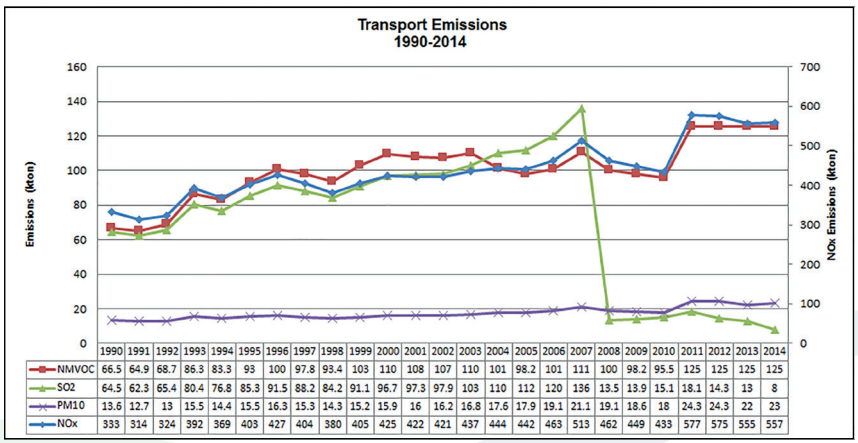
9.4- Emissions of Air Pollutants by Transport

D P S I R

Air pollutant emissions from transport are a significant pressure indicator on the effect of transportation on air pollution.

The transport is an important sector in the National Air Emission Inventory. Emissions originated from road transport, navigation, aviation and railways are separately calculated. The graph below shows the emissions national total emissions rising from land transport. Regarding the emissions between 1990 and 2014, it can be observed that there is significant decrease in SO2 emissions from 2008 on, due to a legislation banning the sulphur content of the fuels. However, increase in the other pollutant emissions could be a result of increasing number of vehicles.

GRAPH 69- TOTAL TRANSPORT EMISSIONS (1990-2014)



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
NMVOC	66.5	64.9	68.7	86.3	83.3	93	100	97.8	93.4	103	110	108	107	110	101	98.2	101	111	100	98.2	95.5	125	125	125	125
SO2	64.5	62.3	65.4	80.4	76.8	85.3	91.5	88.2	84.2	91.1	96.7	97.3	97.9	103	110	112	120	136	13.5	13.9	15.1	18.1	14.3	13	8
PM10	13.6	12.7	13	15.5	14.4	15.5	16.3	15.3	14.3	15.2	15.9	16	16.2	16.8	17.6	17.9	19.1	21.1	19.1	18.6	18	24.3	24.3	22	23
NOx	333	314	324	392	369	403	427	404	380	405	425	422	421	437	444	442	463	513	462	449	433	577	575	555	557

Source: Ministry of Environment and the Urbanisation, General Directorate of Environmental Management

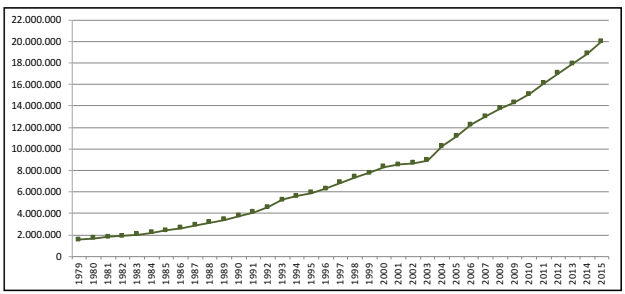
9.5- Number of the Road Motor Vehicles in Use

Emissions resulted from road motor vehicles is one of the major causes of air pollution especially in metropolitan cities. The number of vehicles is a pressure indicator.

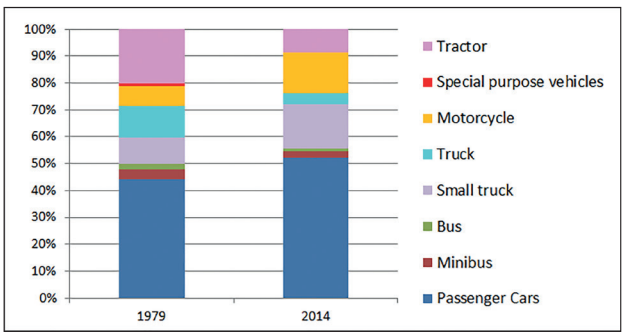
The number of total road motor vehicles, which was 1,566,405 in 1979, increased especially after 2004 and reached 19,994,472 in 2015. When types of road motor vehicles share between 1979 and 2015 are compared, the increase in the rates of automobiles, vans and motorcycles is remarkable. Automobiles constitute 53% of the total road motor vehicles in 2015, vans 16.3%, motorcycles 14.7%, tractors 8.5%, trucks 4%, minibuses, 2.2%, buses 1.1% and special purposed vehicles 0.2%.

When some members of the European Union and Turkey are compared with 2013 data; the number of cars per 1000 people was 402 in Bulgaria, 608 in Italy, 574 in Finland, 504 in Poland, 543 in Germany, 474 in Spain and 121 in Turkey [48].

GRAPH 70- NUMBER OF THE ROAD MOTOR VEHICLES BY YEARS (1979-2015)



GRAPH 71- 1979 and 2015 DISTRIBUTION OF ROAD MOTOR VEHICLES IN TERMS OF THEIR TYPES (%)



Source: *TURKSTAT.*
Note: *Since 2004, vehicles covered under work machinery and heavy vehicles covered under special purpose vehicles are shown under "Truck" figures.*

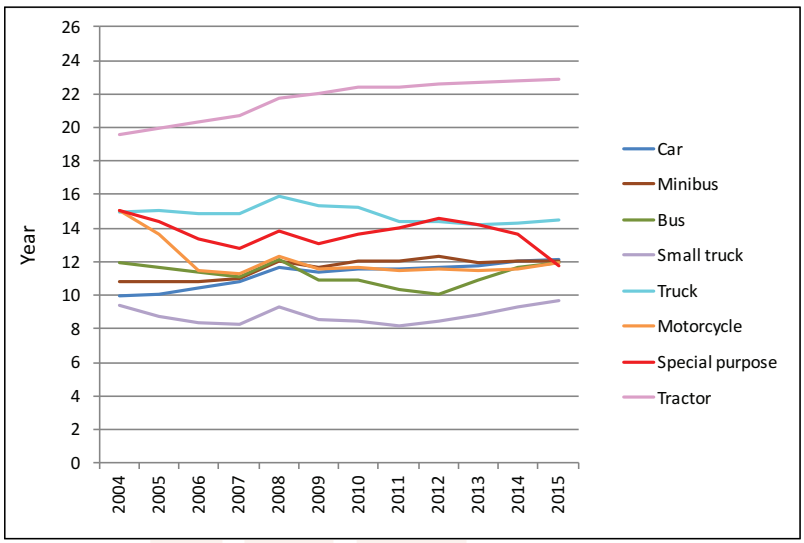
9.6- Average Age of Vehicles Registered to the Traffic

This indicator is a driving force indicator as an indirect indicator of environmental performance of road transport. By exchanging old and polluting vehicles with younger and less polluting ones, the value of this indicator and the impact on the environment is expected to reduce.

However, data shows that, average age of the total registered cars increased from 12 in 2004 to 12.7 in 2015 as a consequence of the economic situation and tax policies. During the same period, average age of passenger cars has increased from 10 to 12.1 by 21%. Average ages for various vehicle types in 2015 are as follows: 12 for minibuses, 9.7 for small trucks, 14.5 for trucks, 11.8 for special purpose vehicles, 22.9 for tractors, 22.9 for motorcycles and 11.9 for buses.

The average age of road vehicles in Europe has increased since 2000. In 2014, the average age of passenger cars was 7.4 years, 8% older than that of the average fleet in 2000.

GRAPH 72- AVERAGE AGE OF VEHICLES REGISTERED TO THE TRAFFIC ACCORDING TO THEIR TYPES



Source: TURKSTAT

For other vehicle types, the average age was 8.4 years for vans, 8.1 years for heavy duty vehicles, 9.1 years for two-wheelers, and 9.4 years for buses [49]. Age group distribution of vehicles registered to the traffic in 2015: 33.4% of the vehicles are at 0-5 years age range, 21.7% at 6-10 years, 11.4% at 11-15 years, 11.3% at 16-20 years range and 22.25 of the vehicles are older than 20 years.

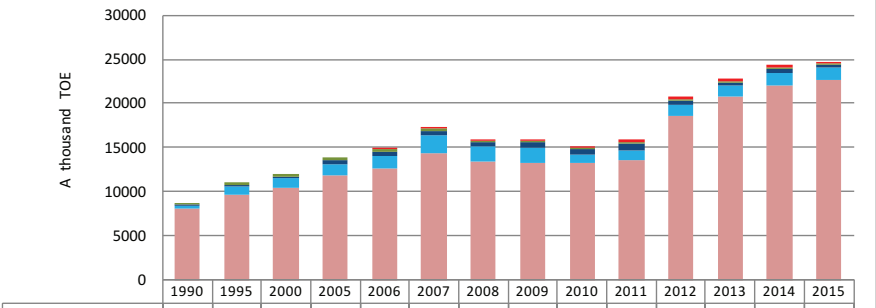
9.7- Final Energy Consumption by Mode of Transport

D P S I R

Energy consumption is an important driver of environmental pressures, most notably climate change. Reductions in fuel consumption in the transport sector, and/or reductions of its related impacts, may be achieved via three primary means: reduce transport demand by limiting the number of trips and their length; shift to more fuel efficient transport modes; increase the energy efficiency of vehicles and their energy sources; includes fuel switching, i.e. changing to renewable or low carbon fuels such as sustainable biofuels or using renewable generation technologies for electric or fuel cell vehicles [50].

Energy consumption by aviation has increased by 351% from 1990 to 2015. Road and maritime transport follow by 183% and 19% respectively. On the contrary, energy consumption by railway transport has decreased by 34%.

GRAPH 73- FINAL ENERGY CONSUMPTION BY MODE OF TRANSPORT



	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pipeline Transportation	0				115	158	170	182	218	264	260	253	311	278
Rail	238	266	270	285	289	217	164	162	170	173	166	162	183	157
Domestic Navigation	159	226	195	411	464	507	491	525	541	718	528	370	432	189
Domestic Aviation	311	924	1034	1368	1509	2014	1748	1721	956	1127	1258	1253	1367	1405
Road	8015	9652	10509	11784	12604	14368	13402	13306	13251	13569	18540	20734	22058	22712

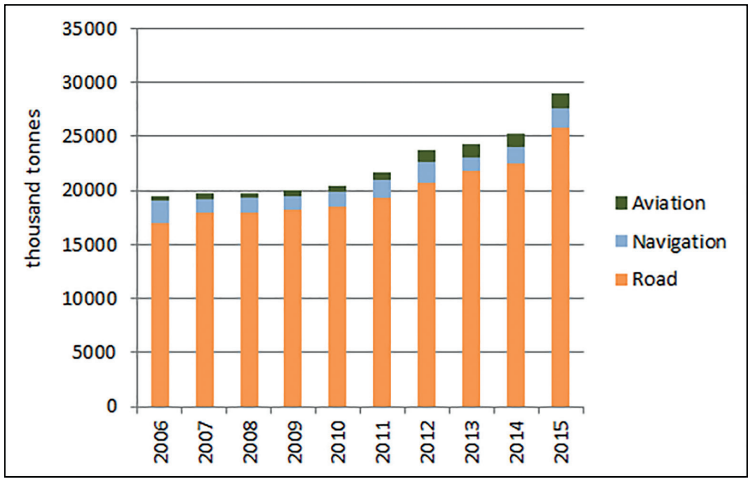
Source: Ministry of Energy and Natural Resources, http://www.eigm.gov.tr/en-US/Balance-Sheets

Total energy consumption by the transport sector as a whole was 24,740 thousand TOE (Tonnes of Oil Equivalent) in 2015, with a 184% increase compared to 1990. In 2015, the total amount of energy consumed in the transportation sector has increased by 184% compared to 1990. Excluding the 278 thousand TOE consumed by pipeline transport, 92.8% of the total transport consumption of 24,462 thousand TOE was consumed by road transport. 5.7% of the copnsumption was by aviation, 0.8% by domestic navigation and 0.6% consumed by railroad transport.

According to 2014 EU-28 countries data, 94.8% of the final energy consumption by transportation was by road transport, 1.7% by domestic aviation, 1.4% by domestic navigation and 2% by railroad transport [51].

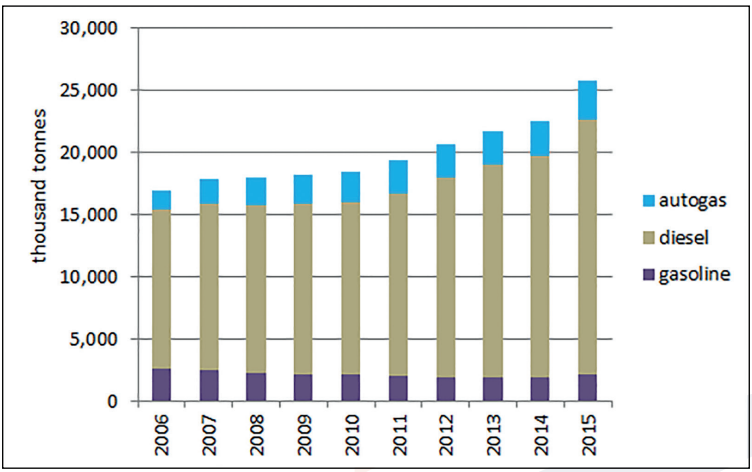
Fuel consumption according to transport mode:
In 2015, fuel consumption was 25,740,274 tons in road transport, 1,898,474 tons in maritime transport and 1,319,436 tons in aviation. Out of the 25,740,274 tons consumed in road transport, 80% (20,573,789 tons) were diesel fuels, 12% (3,069,237 tons) were LPG and 8% (2,097,248 tons) were gasoline.

GRAPH 74- FUEL CONSUMPTION BY MODE OF TRANSPORT



Source: Republic of Turkey Energy Market Regulatory

GRAPH 75- FUEL CONSUMPTION BY ROAD TRANSPORT ACCORDING TO THE FUEL TYPES (1)



Source: Republic of Turkey Energy Market Regulatory
(1) Data includes dealer sales (including vehicle recognition system sales), sales to the free user license holders and military deliveries; but military sales directly by the refineries are excluded

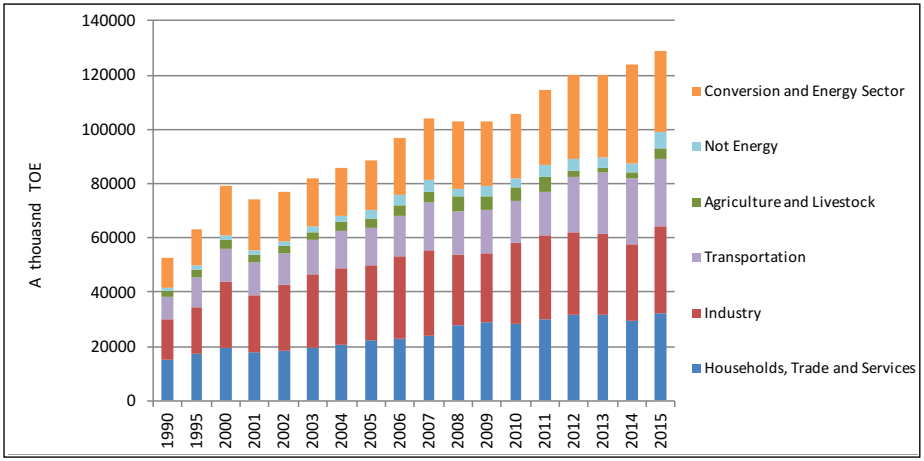
10.1- Primary Energy Consumption by Sectors

D P S I R

This driving force indicator is related to the energy consumption. Turkey's total primary energy consumption was 129,106 thousand TOE (Tonnes of Oil Equivalent) in 2015. Increase in 2015 was 145.1% compared to 1990, 45.6% compared to 2005 and 4.1% compared to 2014. In 2013, primary energy consumption in the EU-28 countries was almost the same as in 1990. Between 2005 and 2013, primary energy consumption in the EU28 countries decreased by 8.3% [53].

Considering the distribution of primary energy consumption in 2015, it is seen that the highest consumption takes place in the housing, trade and services sector with 25.2%. This is followed by industry with 24.8%, energy and conversion sector with 23.5%, transport with 19.2%, non-energy with 4.4% and agriculture and livestock sector with 3.1%.

GRAPH 76- PRIMARY ENERGY CONSUMPTION BY SECTORS (Thousand TOE)



Source: Ministry of Energy and Natural Resources, http://www.eigm.gov.tr/en-US/Balance-Sheets

TABLE 39- PRIMARY ENERGY CONSUMPTION BY SECTORS

YEARS	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Total (Thousand TOE)	52,682	63,058	79,150	88,642	105,827	114,481	120,093	120,288	123,973	129,106
Households, Trade and Services	15,354	17,507	19,743	22,394	28,315	29,974	31,509	31,402	29,675	32,471
Industry	14,470	17,163	24,307	27,562	29,982	30,929	30,411	30,137	28,115	31,974
Transport	8,723	11,066	12,007	13,849	15,136	15,852	20,753	22,772	24,351	24,740
Agriculture and Livestock	1,956	2,556	3,073	3,359	5,095	5,755	1,944	1,633	1,896	3,974
Not Energy	1,031	1,386	1,915	3,296	3,459	4,442	4,390	3,479	3,131	5,652
Conversion and Energy Sector	11,148	13,380	18,104	18,182	23,839	27,528	31,086	30,866	36,805	30,295

Source: Ministry of Energy and Natural Resources, http://www.enerji.gov.tr/tr-TR/EIGM-Raporlari

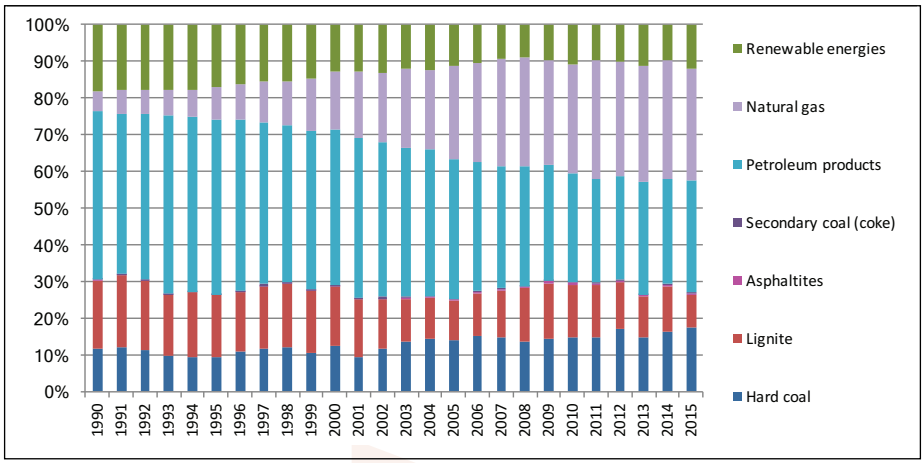
10.2- Primary Energy Consumption by Fuel Type

D P S I R

Total primary energy consumption according to type of fuel is an indicator of a driving force which describes the improvement in energy resources and the level of consumption. Fossil fuel consumption (crude oil, petroleum products, mineral coal, lignite, natural and derivative gases) is a surrogate indicator of resource consumption, greenhouse gas emissions and air pollution (SO2 and NOX) levels. The level of the environmental impact depends on the relative portions of the fossil fuels used and the applied magnitude of the precautions taken to reduce pollution.

As of 1990, the total share of primary energy consumption of Turkey in terms of coal and its derivatives was 30.6% (coal, 11.7%, lignite 18.6%, asphaltite 0.2% and coke 0.1%). While the share of petroleum products is 45.9%, the share of natural gas is 5.3% and the share of renewable energy sources is 18.3%.

GRAPH 77- PRIMARY ENERGY CONSUMPTION BY FUEL TYPE (%)



Source: Ministry of Energy and Natural Resources, http://www.eigm.gov.tr/en-US/Balance-Sheets

As of 2015, 26.9% of Turkey's primary energy consumption was met by coal and its derivatives (hard coal 17.3%, lignite 9.0%, asphaltite 0.4% and coke 0.2%). While the share of petroleum products has decreased to 30.4%, the share of natural gas has increased to 30.7%. The share of renewable energy sources has fallen to 11.9%. As of 2013, 18.2% of the primary energy consumption of the EU-28 countries was made up of coal and lignite, 30.1% from petroleum, 23.8% from natural gas, 14.4% from nuclear power, 12.6 % from renewable energy and 0.8% from non-renewable waste [53].

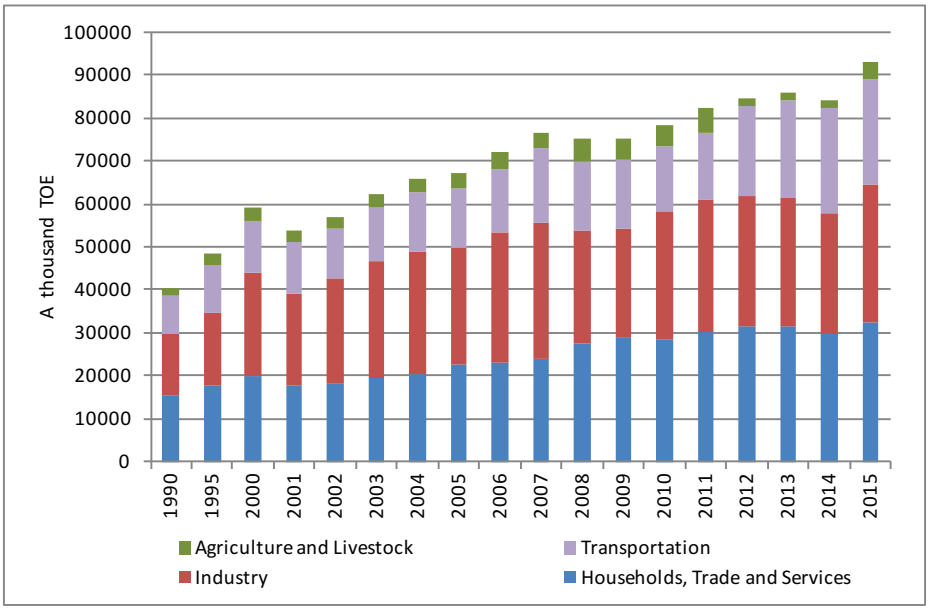
10.3- Final Energy Consumption by Sectors

D P S I R

Final energy consumption by sector is a driving force indicator. The trend in final energy consumption by fuel type and by sector provides a broad indication of progress in reducing final energy consumption and associated environmental impacts by the different end-use sectors (transport, industry, services and households).

The total final energy consumption in Turkey was 93,159 thousand TOE in 2015, with an increase of 130% compared to 1990, 38.7% compared to 2005, and decrease of 10.85% compared to 2014. Final energy consumption increased by 9.4% in the housing, commerce and services sectors, by 13.7% in the industrial sector and by 1.6% in the transport sector by 2015 compared to 2014 (Table 39). Between 1990 and 2013, final energy consumption in the EU-28 increased by 2.2%. Between 2005 and 2013, final energy consumption decreased by 7.0% in the EU-28[54].

GRAPH 78- FINAL ENERGY CONSUMPTION BY SECTORS (Thousand TOE)



Source: Ministry of Energy and Natural Resources, http://www.eigm.gov.tr/en-US/Balance-Sheets

Looking at the amount of final energy consumption in 2015, it reveals that household-trade consumption-services (34.86%) and industry sector (34.32) have the highest consumption rate, while the transport sector (26.56%) and agriculture and livestock sector (4.27%) followed.

For comparison with the EU-28 countries, in 2013 highest share in energy consumption was by household consumption and services with 40.62% (households 26.8%, services 13.82%); followed by transport (31.58%), industry (25.06%) and agriculture-fisheries-forestry (totally 2.74%) in the EU-28 member states [54].

10.4- Energy Consumption per Capita

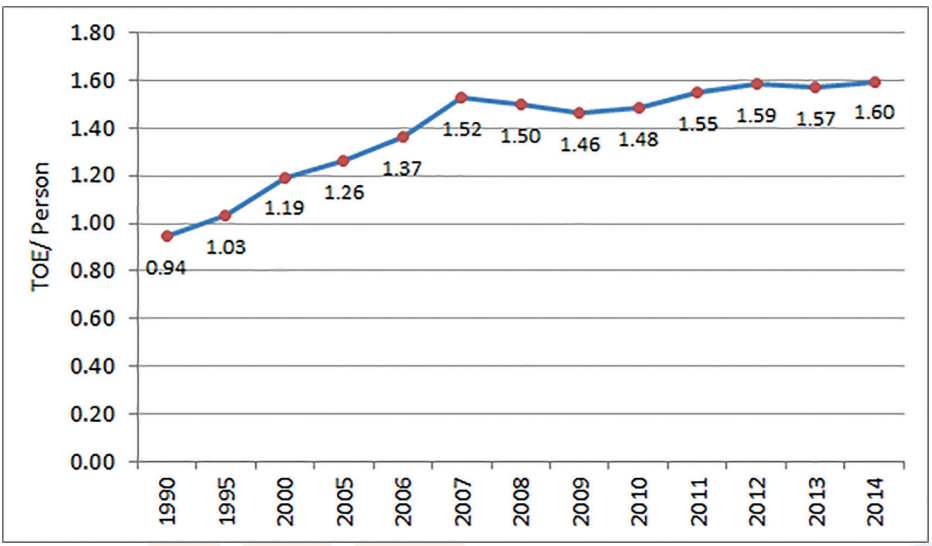
D P S I R

This driving force indicator shows energy consumption levels.
Primary energy consumption in Turkey was 0.94 TOE per capita in 1990 and 1.64 TOE in 2015.

In European Union countries, per capita primary energy consumption was 2.9 TOE in 1990 and 3.2 TOE in 2013 [55].

The average of 28 EU countries was 2.2 TEP, while the final energy use per capita in Turkey was 1.1 TEP in 2013 [54].

GRAPH 79- PRIMARY ENERGY CONSUMPTION PER CAPITA THROUGH THE YEARS (TOE/PERSON)



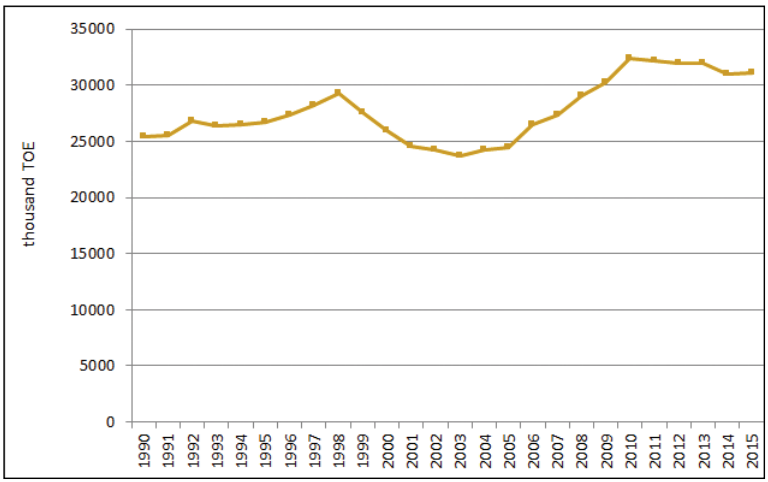
Source: Ministry of Energy and Natural Resources, http://www.eigm.gov.tr/en-US/Balance-Sheets

10.5- Primary Energy Production

D P S I R

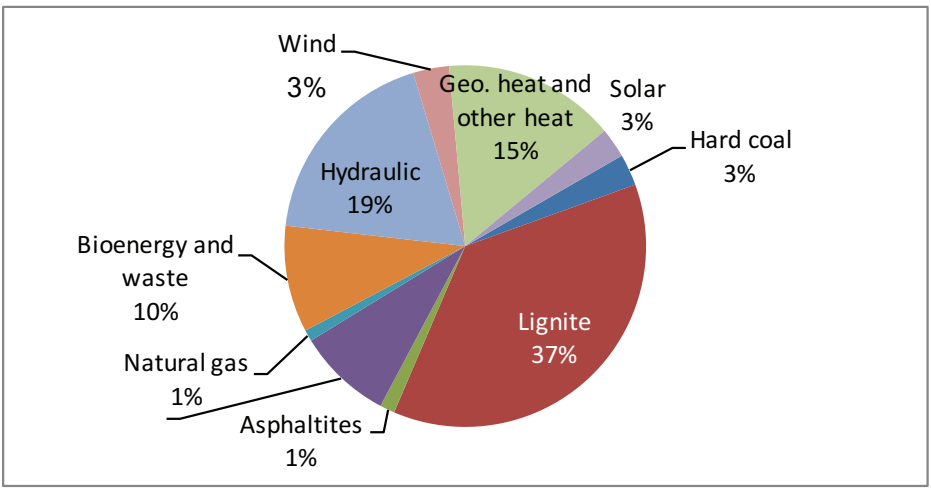
This indicator is a driving force indicator. While total primary energy produced in 1990 was 25,459 thousand TOE, it became 31,131 thousand TOE in 2015. From 1990 to 2015, the primary energy rate has been increased by 22.3%.

GRAPH 80- PRIMARY ENERGY PRODUCTION BY THE YEARS (Thousand TOE)



Source: Ministry of Energy and Natural Resources, http://www.enerji.gov.tr/tr-TR/EIGM-Raporlari

GRAPH 81- DISTRIBUTION OF RESOURCES BY PRIMARY ENERGY PRODUCTION (%) IN 2015



Source: http://www.eigm.gov.tr/en-US/Balance-Sheets

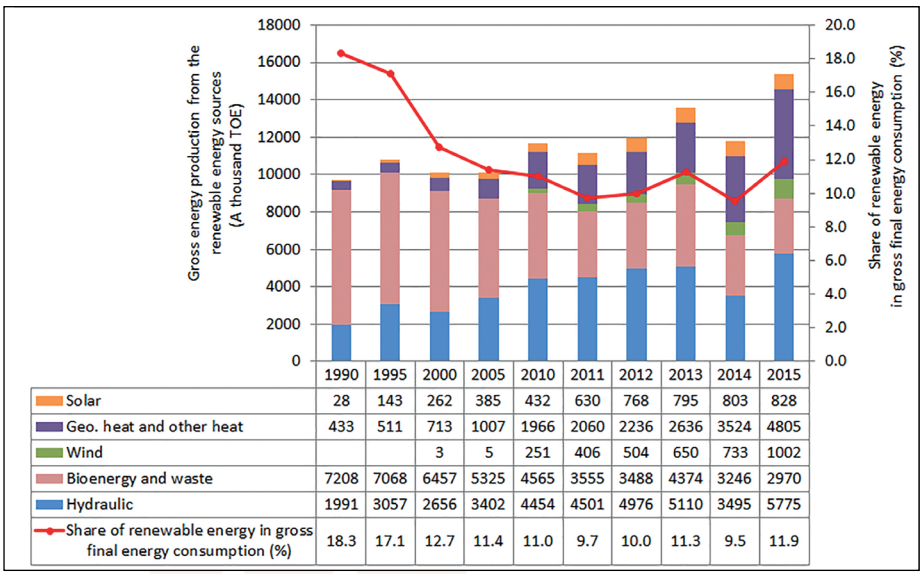
10.6- Share of Renewable Energy Sources in Gross Final Energy Consumption

D P S I R

This response indicator displays the ratio of the energy produced by the renewable sources. Renewable energy sources are environment-friendly and have much lower CO2 emission values per power unit generated.

The most common renewable energy sources in Turkey are solar, wind, hydraulic, geothermal and biomass (wood, animal and plant residues) energy forms. While the primary energy supply value is 129,106 thousands TOE, domestic gross energy production has reached to the value of 31,131 thousands TOE at the end of 2015. Renewable resources share is 49%, equal to 15,380 thousands TOE, within the domestic gross energy production.

GRAPH 82- GROSS ENERGY PRODUCTION FROM THE RENEWABLE ENERGY SOURCES IN TURKEY and SHARE OF RENEWABLE ENERGY IN GROSS FINAL ENERGY CONSUMPTION



	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Solar	28	143	262	385	432	630	768	795	803	828
Geo. heat and other heat	433	511	713	1007	1966	2060	2236	2636	3524	4805
Wind			3	5	251	406	504	650	733	1002
Bioenergy and waste	7208	7068	6457	5325	4565	3555	3488	4374	3246	2970
Hydraulic	1991	3057	2656	3402	4454	4501	4976	5110	3495	5775
Share of renewable energy in gross final energy consumption (%)	18.3	17.1	12.7	11.4	11.0	9.7	10.0	11.3	9.5	11.9

Source: Ministry of Energy and Natural Resources, http://www.eigm.gov.tr/en-US/Balance-Sheets

While contribution of renewables to total energy consumption was 18.3% in 1990, in parallel with increasing energy demand, this figure decreased to almost 11.9% in 2015. The share of renewable energy in EU-28 primary energy consumption increased from around 4.5% in 1990 to 12.6% in 2013 [56].

10.7- Share of Renewable Electricity in Gross Electricity Production

D P S I R

This response indicator is obtained by the calculation of the ratio of the amount of the electricity produced by renewable sources to the (total) gross electricity consumption (Total electricity produced + electricity imported – electricity exported).

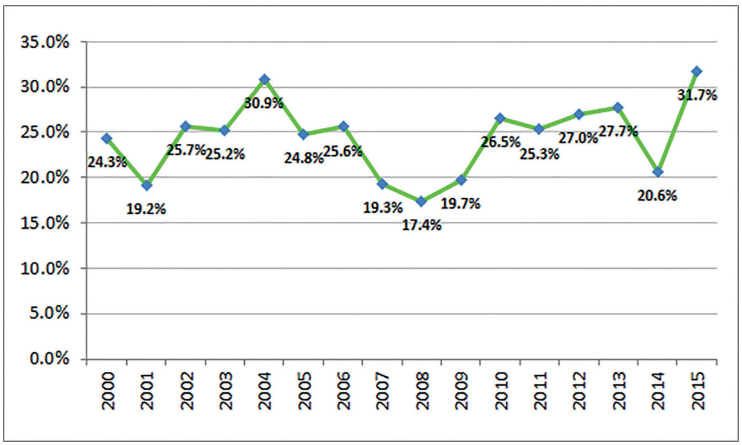
As of the end of 2015, Turkey's gross electricity consumption was 265,724.4 GWh. Electricity produced from renewable sources (84,175.1 GWh) was 31.7% of gross electricity consumption.

GRAPH 40- GROSS ELECTRICITY PRODUCTION FROM RENEWABLE ENERGY SOURCES IN 2015 (GWh)

SOURCES	PRODUCTION (GWh)
GEOTHERMAL	3,424.5
OTHER+WASTE	1,758.2
HYDRAULIC	67,145.8
WIND	11,652.5
SOLAR	194.1
TOTAL	**84,175.1**

Source: Turkish Electricity Transmission Company (TEIAS), http://www.teias.gov.tr/YukTevziRaporlari.aspx

GRAPH 83- SHARE OF RENEWABLE ELECTRICITY IN GROSS ELECTRICITY CONSUMPTION (%)



Sources: 1) For 2000-2012 years data TURKSTAT "Sustainable Development Indicators", http://www.tuik.gov.tr/PreTablo.do?alt_id=1097,
2) For 2013, 2014 and 2015 data are calculated from data Turkish Electricity Transmission Company.

According to European Statistical Office (EUROSTAT), In 2014, the share of renewable electricity in gross electricity consumption was 27.5% in the EU-28 [57].

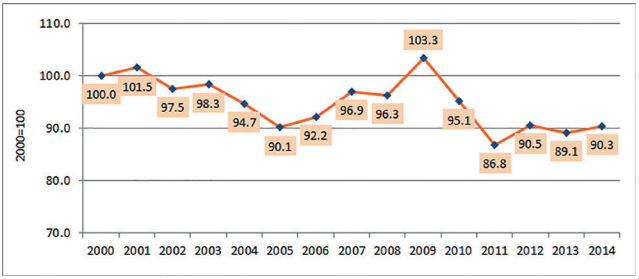
10.8- Primary and Final Energy Intensity

D P S I R / D P S I R

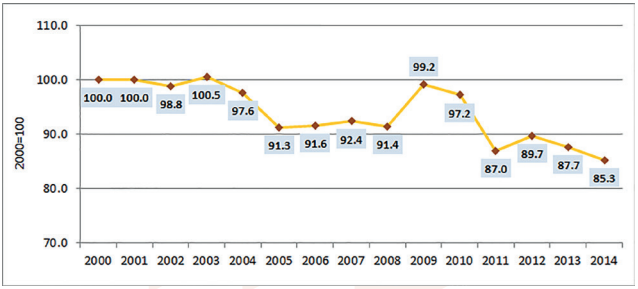
Primary energy intensity is a response; final energy intensity is a driving force indicator. Primary energy intensity is an energy efficiency indicator measuring how much energy required tocreate one unit of Gross National Product on the regional and countries bases. The level of the mentioned indicator has pointed out the economic structure of regions or countries, the energy consumption structure, climatical conditions and technical energy efficiency. Energy intensity trend have been affected from the structural changes in economy and industry, changes in energy consumption structure and the equipment used by final users and efficiencies in the building sector.

In Turkey in the period 2000-2014 primary energy intensity index have been decreased by 0.6% and final energy intensity index have been decreased by 1.0% on the annual bases. As compared with the year 2000, there is an improvement of 9.7% in the primary energy intensity index and 14.7% in the final energy intensity index in 2014 [58].

GRAPH 84- DEVELOPMENT OF PRIMARY ENERGY INTENSITY INDEX (with climatic correction)



GRAPH 85- DEVELOPMENT OF FINAL ENERGY INTENSITY INDEX (with climatic correction)



Source: *Ministry of Energy and Natural Resources, General Directorate of Renewable Energy.*
Note: *1) The new Gross National Product series on the 1998 basis have been used for the calculation of the mentioned intensities.*
2) Primary and final energy intensities unit have been taken as (toe/1000 the Dollar constant price of the year 2005)

10.9- Energy Efficiency in Buildings

D P S I R

This is a response indicator.
When energy efficiency and savings potential of the construction sector is compared with current consumption, we can reach a rate of 50%. That 40% of the total energy is consumed in buildings clearly shows the importance of the issue. Energy efficiency in buildings is important not only to save energy but also to reduce greenhouse gas emissions and air pollution.

Within the scope of the 'By-Law on Energy Efficiency in Buildings', to have an Energy Performance Certificate that determines the energy consumption class of the building is obligatory. As of the end of 2015, a total of 350,000 Energy Identity Certificates, 329,000 for new and 21,000 for present buildings have been already issued. By 2023, the Ministry targets an Energy Identity Certificate to be given to all existing and new buildings.

All existing and new buildings are required to fulfil expense sharing applications in central heating systems. Within the context of sharing the expenses of heat for central heating systems, as of the end of 2015, 80 companies have been authorized. It is aimed to reduce the fuel consumption by average of 30% without undermining the comfort conditions in these buildings.

GRAPH 86- NUMBER OF BUILDINGS THAT WERE ISSUED ENERGY IDENTITY CERTIFICATE OVER THE YEARS

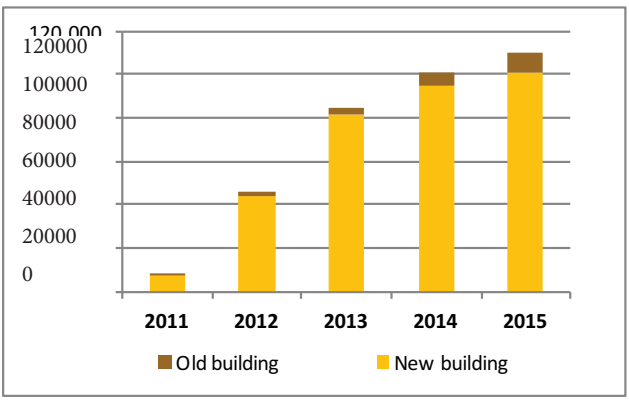


TABLE 41- NUMBER OF BUILDINGS THAT WERE ISSUED ENERGY IDENTITY CERTIFICATE OVER THE YEARS

YEARS	2011	2012	2013	2014	2015
New Building	7,805	43,834	81,375	94,586	101,462
Old Building	400	2,300	3,793	5,937	8,520
TOTAL	**8,205**	**46,134**	**85,168**	**100,523**	**109,982**

Source: Ministry of Environment and Urbanisation, General Directorate of Professional Services

11.1- Number and Area of Mining Facilities According to Their Groups

D P S I R

This indicator is a pressure indicator shows the amount of mines and storage areas registered in a given year according to the different regulatory groups defined in the "By-Law on Implementation of Mining Law". Mining has a significant role due to the direct contribution to the economy and especially inputs provided to the manufacturing sector. However, when mines are being excavated, the country benefit and the environment has to be considered in harmony. In 2015, a total of 20,198 mining licenses were granted by the General Directorate of Mining Affairs. Of these licenses, 6,865 have been granted as exploration license and 13,333 have been granted as running license. The total license area granted in 2015 was 14,038,758 hectares, of which 92% was the Group IV minefields.

GRAPH 87- MINING LICENCES THROUGHOUT TURKEY (2010-2015)

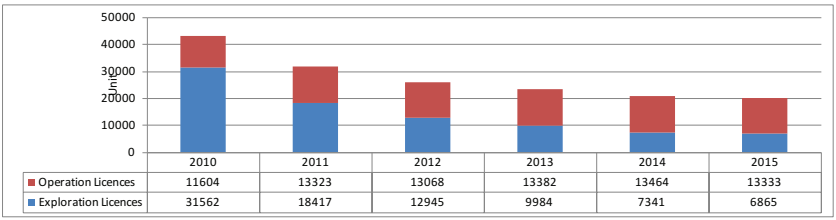


TABLE 42- IN 2015, MINING FACILITIES AND STORAGE AREAS CLASSIFIED ACCORDING TO MINING GROUPS (1)

	Total Mining License Area		Number of Licences	
Group of Mines	**Hectare**	**%**	**Unit**	**%**
I-A Group	531	0.003	57	0.28
I-B Group	40,103	0.26	878	4.35
II. Group	1,044	0.01	11	0.05
II-A Group	436,943	2.87	4,722	23.38
II-B Group	564,578	3.70	5,278	26.13
III-Group	70,709	0.46	71	0.35
IV-Group	14,038,758	92.07	9,081	44.96
Geothermal Resources and Mineral Water Springs	2,347	0.02	5	0.02
Ore Minerals	70,194	0.46	56	0.28
Marble	407	0.003	4	0.02
V-Group	21,927	0.14	35	0.17
2015 GRAND TOTAL	**15,247,541**	**100**	**20,198**	**100**

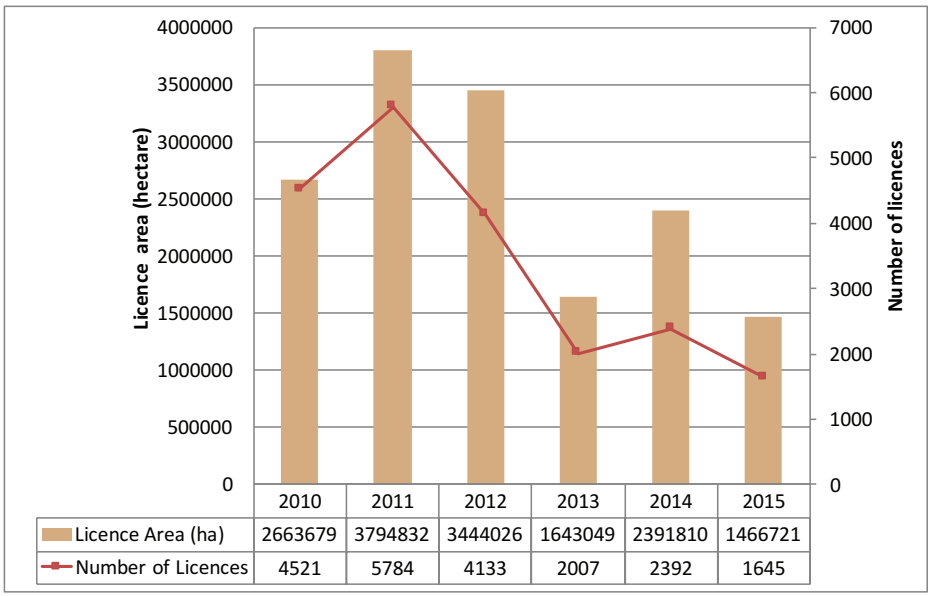
Source: Ministry of Energy and Natural Resources, General Dectorate of Mining Affairs (MİGEM) Oracle Discovery Database.
(1) Mining License Areas are consisting of mineral processing plant, mining and depositing site. Plants and depositing sites' areas are not recorded seperately.

11.2- Number and Area of Abandoned Licenced Mining Facilities

D P S I R

The indicator is a response indicator. Reclamation activities should be carried out in the course of the closure of the activities. It is aimed to restore the damaged areas due to mining activities in order to bring the damaged areas closer to the former economic and environmental conditions by reclamation. According to General Dectorate of Mining Affairs' data, 20,482 mines were abandoned in a total of 15,404,117 hectares area during the period 2010-2015. Number of mining sites shut down are indicated as abandoned.

GRAPH 88- NUMBER AND AREA OF ABANDONED MINING LICENCES (2010-2015)



	2010	2011	2012	2013	2014	2015
Licence Area (ha)	2663679	3794832	3444026	1643049	2391810	1466721
Number of Licences	4521	5784	4133	2007	2392	1645

Source: *Ministry of Energy and Natural Resources, General Dectorate of Mining Affairs (MİGEM) Oracle Discovery Database*

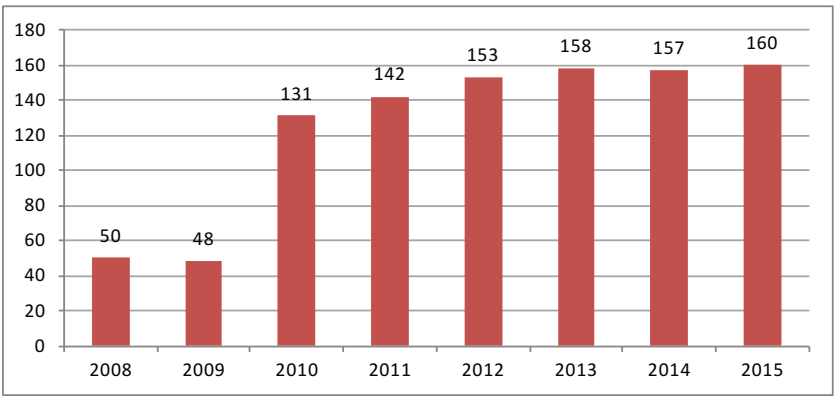
Notes: *(1) Number of mining sites shut down are indicated as abandoned.*
(2) Mining sites that are rehabilitated are not recorded seperately, for that reason abandoned mining sites are also considered as rehabilitated mining sites.

11.3- The Number of Laboratories Operating within Environmental Legislation

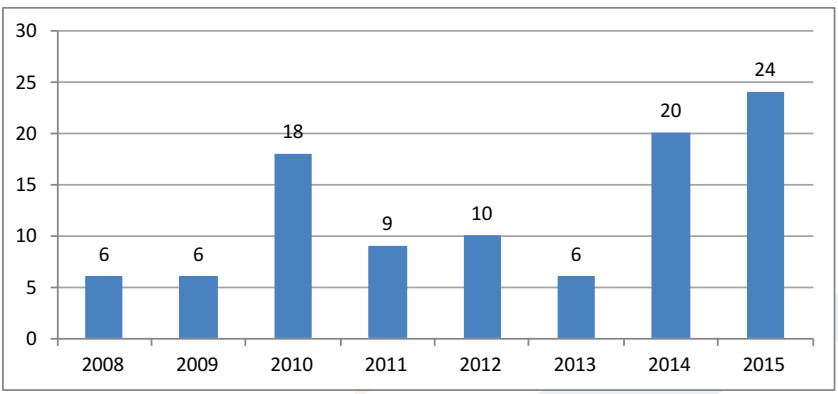
D P S I R

The indicator is a response indicator. In 2015, in Turkey there were 160 laboratories operating within the scope of environmental legislation. The qualifications and the provinces of these laboratories can be inquired at the following address: http://laboratuvar.cevre.gov. tr/yonetim/sorgu.asp within the scope of remote inspections, proficiency assessment tests have been conducted for laboratories authorized by the Ministry since 2008.

GRAPH 89- NUMBER of LABORATORIES OPERATING WITHIN ENVIRONMENTAL LEGISLATION BY YEARS



GRAPH 90- NUMBER OF PARAMETERS USED IN PROFICIENCY TESTS THROUGHOUT YEARS



Source: Ministry of Environment and Urbanisation, General Directorate of the EIA, Permit, and Inspection , Department of Laboratory, Measurement and Monitoring

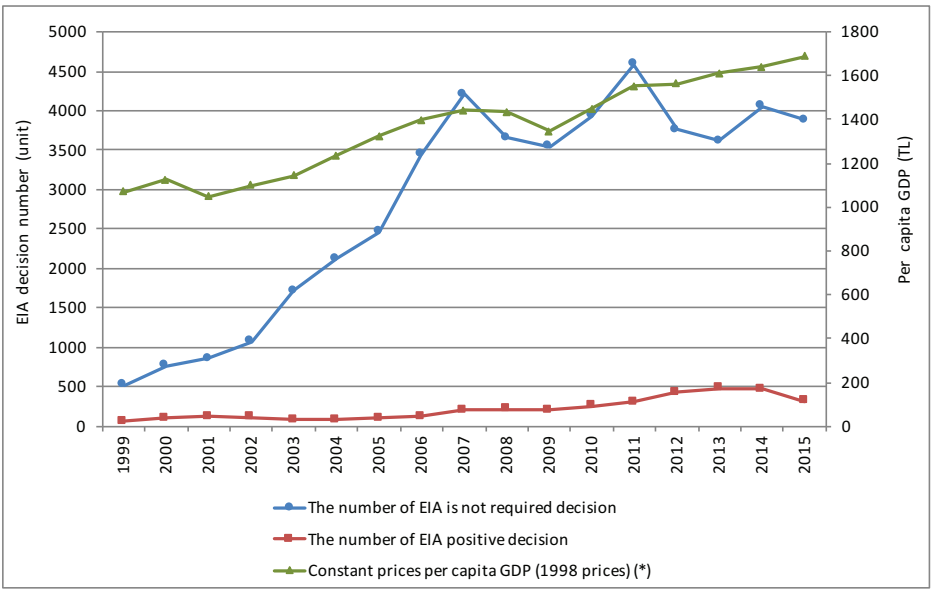
11.4- Environmental Impact Assessment Decisions

D P S I R

The indicator is a response indicator. Environmental impact assessment (EIA), one of the most important tools of sustainable development, has been in implementation in Turkey since 1993. EIA is a tool implemented to prevent the potential impacts of the projects planned on the environment and in determining the technological alternatives together with the selected location. Before the projects are put into practice, it is mandatory to receive a certificate of EIA Positive/ EIA not necessary within the scope of EIA legislation.

EIA decisions are significant as a reflection of the level of industrialization and development process of Turkey.

GRAPH 91- THE NUMBER OF EIA POSITIVE AND EIA NOT NECESSARY DECISIONS BETWEEN 1993 WHEN THE FIRST EIA LEGISLATION WAS PUBLISHED AND 2015 AND GDP PER CAPITA

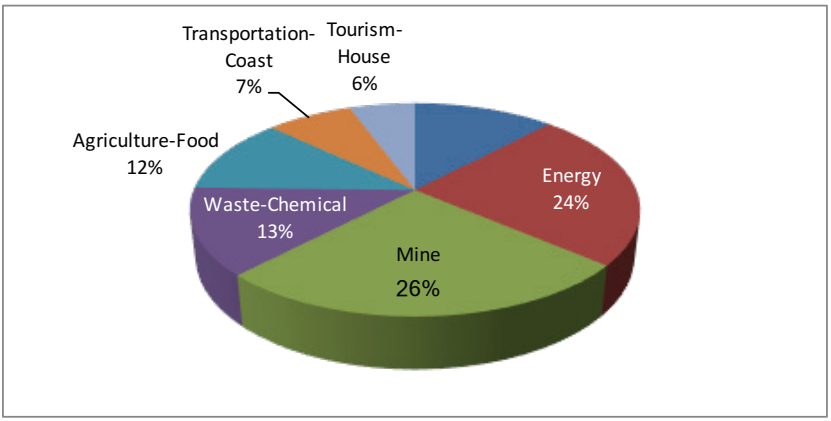


Source: *EIA data of the Ministry of Environment and Urbanisation, General Directorate of EIA, Permit and Inspection, the TURKSTAT data for GDP per capita*
(*) 1986-2023 mid-year population estimations and projections were used and, GDP per capita was revised in 1998.

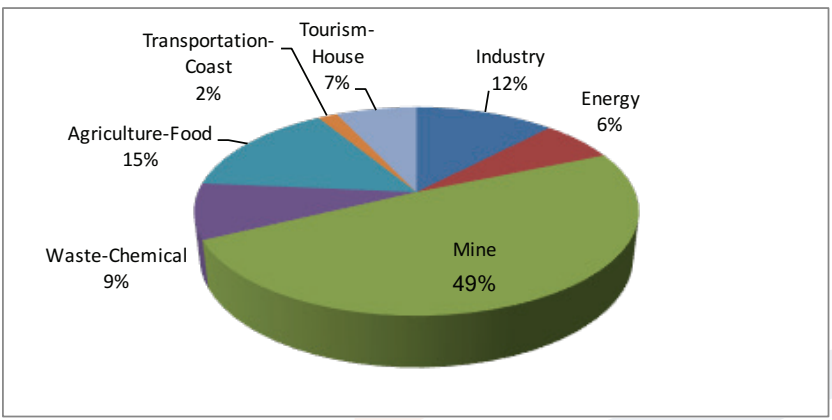
In summary, the *"EIA Positive Decisions"* are defined as the positive decisions made after investigating projects existing in the list in annex 1 of the Legislation which have relatively high environmental impacts. *"EIA not necessary"* decisions are the positive decisions given through the screening of the projects existing in the list annex 2 of the legislation which have relatively fewer impacts on the environment when compared to annex 1.

In Turkey, the first EIA Regulation was published in 1993 and by the end of 2015, a total of 4051 "EIA positive" decisions were given. When these decisions are investigated according to the distribution by sector we can see that mining investments ranked the first with 26%, and it is followed by energy investments with 24% and waste industry and the chemical industry investments with 13%. From 1993 up to the end of 2015 a total of 51,200 "EIA not required" decisions were given and according to the distribution by sector mining investments again ranked the first with 49%. That is followed by agriculture and food investments with 15% and industrial investments with 12%.

GRAPH 92- DISTRIBUTION OF EIA POSITIVE DECISIONS BY SECTOR BETWEEN1993-2015



GRAPH 93-DISTRIBUTION OF EIA IS NOT REQUIRED DECISIONS BY SECTOR BETWEEN 1993-2015



Source: Ministry of Environment and Urbanisation, General Directorate of the EIA, Permit and Inspection

12.1- Agricultural Land Per Person

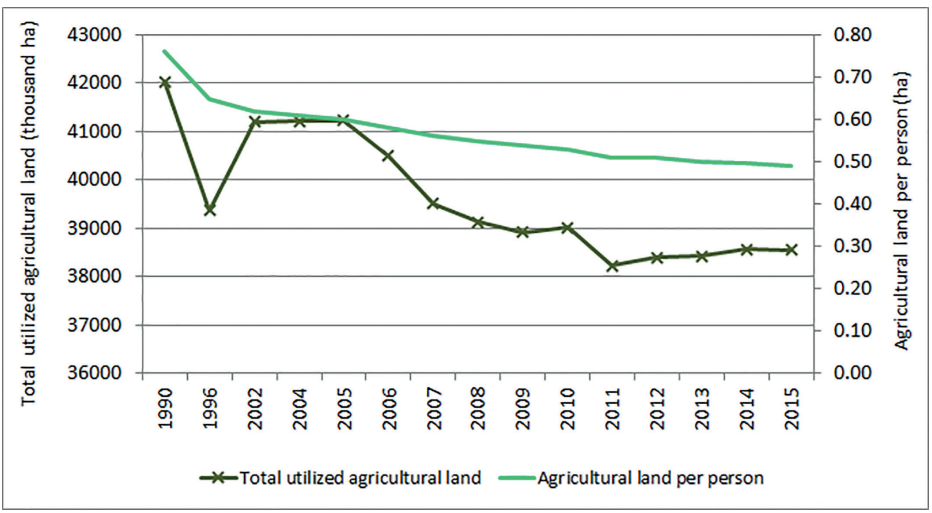
D P S I R

This indicator is a state indicator. While our agricultural land is essential for herbal production, our pastures, winter quarters and summer pasture are necessary for the improvement of animal husbandry and protection of the nature.

According to the data of TURKSTAT, in 2015, total utilized agricultural land was approximately 38,551 thousand hectares (this includes land under permanent meadows and pastures). Of the total agricultural land, 53.6% was arable areas, 8.5% was permanent crops areas (perennial fruits), and 37.9% was permanent meadows and pastures areas.

Due to the increase in Turkish population, total agricultural area decreased, which resulted in a decline in the amount of agricultural land per capita. From 1990 to 2015, Turkish population rose by 39.4% while agricultural land per capita decreased by 35.6%.

GRAPH 94- AGRICULTURAL LAND PER CAPITA AND PER PERSON THROUGH THE YEARS



Sources: Ministry of Food, Agriculture and Livestock, TURKSTAT
(1) For land under permanent meadows and pastures 2001 General Agricultural Censuses, for other Ministry of Food, Agriculture and Livestock
(2) Data are grouped according to Statistical Classification of Products By Activity in European Economic Community (CPA 2002).

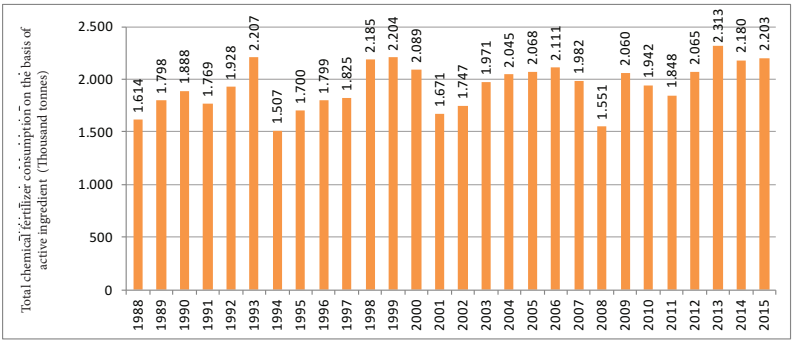
In 1990, agricultural land per capita was 0.76 hectares, this number decreased to 0.49 hectares by 2015. As of 2015, when total arable land and land under permanent crops is considered (23,934 thousand hectares) the area per person was 0.3. Arable land available per person for the world is 0.2 hectares and 0.21 hectares in European Union in 2013 [60].

12.2- Chemical Fertilizer Consumption

D P S I R

This indicator is a pressure indicator and in agricultural sector, the part of fertilizer not absorbed by plants and leaking to surface waters is an important cause of eutrophication.In Turkey, total chemical fertilizer usage, within the perspective of active ingredient-nutrient, has been increased steadily between the years of 1988-2015 although some fluctuations have been observed. Total chemical fertilizer use, within the perspective of nutrient rose from 1,613,692 tons in 1988 to 2,202,735 tons in 2015 and proportional compounds of the fertilizers have been as 67.5% nitrogen, 26.5%, P2O5 and 6% K2O. Konya is rated as the most fertilizer consuming province in 2015 with the fertilizer consumption share of 8.8% within the perspective of nutrient. That was followed by Şanlıurfa (7.6%), Adana (5.4%), Diyarbakır (3.5%), Hatay (3.3%), Ankara (3.1%), Tekirdağ (2.8%), İzmir (2.7%) and Mardin (2.7%).

GRAPH 95- THE CONSUMPTION OF CHEMICAL FERTILIZER ON THE BASIS OF NUTRIENT OVER THE YEARS



Source: Ministry of Food, Agriculture and Livestock

By year of 2015, total chemical fertilizer used agricultural area is 23.9 million hectares and fertilizer use for per hectare is approximately 92.2 kg (on the basis of nutrient). In the individual regions of Turkey second and third agricultural product grown area, there have been observed extreme fertilizer use. Within this asset, farmers are supported for soil analysis by the Ministry of Food Agriculture and Livestock in order to provide conscious fertilizer use. According to World Bank's 2013 data, average fertilizer use of EU-27 countries for per hectare (on the basis of nutrient) was 179.85 kg/hectares. However, fertilizer use for per hectare among the EU countries rise up to 502.1 kg/hectare in Ireland, 397.1 kg/hectare in Malta, 286.6 kg/hectare in Belgium and 267.4 kg/hectare in Slovakia. Lowest fertilizer use levels in EU countries are ranged as Romania with 56.2 kg/hectare, Estonia as 83.1 kg/hectare, Sweden as 84.3 kg/hectare and Lithuania as 84.5 kg/hectare. This level in Turkey is 113.5 kg/hectare [61].

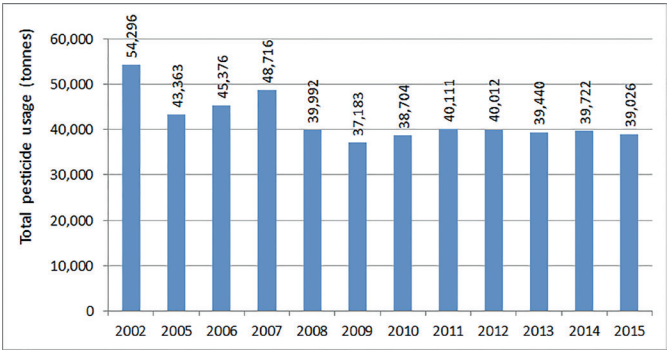
12.3- Pesticide Use

D P S I R

This indicator is a pressure indicator. Between 2002 and 2015, while total use of pesticides fluctuated, it showed a general tendency to decrease. The total pesticide usage in Turkey for 2002 was 54,296,437 kg/lt (kg or lt) and for 2005 it was 43,362,627. This number decreased to 39,026,438 kg/lt in 2015.

In 2015, highest regional pesticide use (28.19% of total pesticide use) was in Mediterranean Region in Turkey. This was followed by Aegean, Inner Anatolia and Marmara Region respectively. The use in East and Southeast Anatolian Region is only 11.30% of the total Turkish consumption. Black Sea Region has the last place with the 3.77%. In 2015, the province which has the highest pesticide use was Manisa with 4,510,668 kg/lt (11.50% of the total consumption).

GRAPH 96- AMOUNT OF TOTAL PESTICIDE USE OVER THE YEARS



Source: Ministry of Food, Agriculture and Livestock

When the amount of pesticide use was evaluated based on groups, the largest group is composed of fungicides (fungi killer) in Turkey as well as in the world. 2015 total pesticide use was composed of 40.96% of fungicides, 20.80% of insecticides, 20.05% of herbicides, 4.04% acaricides, 0.5% rodenticides and 13.65% by others (nematocides, mollucides, and mineral oils).

Dissemination of Integrated Protection Management (IPM) which are accepted all over the world in struggle with harmful organisms in plants, the implementation of pre-harvest pesticide control program, the introduction of biologic and biotechnical combat methods from alternative methods that do not use any chemicals, and the inclusion of agricultural support programs such as farmers' field schools in Turkey have made a significant contribution in the reduction of pesticide use in Turkey. It is aimed to limit the pesticide use at about yearly 40,000 tonnes by 2023 by the Ministry of Food, Agriculture and Livestock. [62].

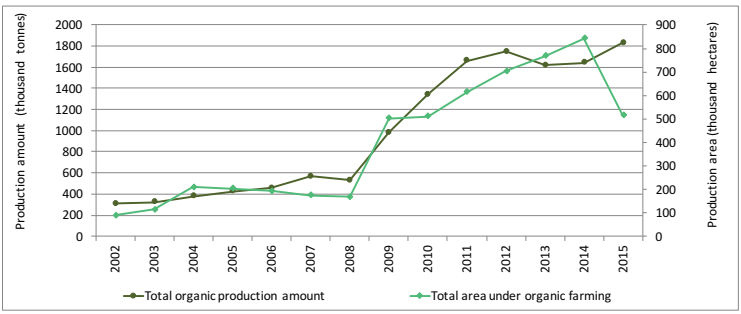
12.4- Organic Farming Areas and Amount of Production

D P S I R

Organic farming is an environmentally friendly farming practice and it is a response indicator. In 1985 the organic agriculture applications started with 8 types of crops due to the demand in exporting and this number reached to 197 in 2015 as there was an increase in the demand. In 2002 12.428 producers planted 89,827 hectares and harvested 310,125 tonnes of organic product. In 2015 this amount reached to 1.829.291 tonnes and 69.949 farmers, planted 515.268 hectares. Total agricultural land applied organic farming including wild collection is 515.268 ha and 486.069 ha of the area is used for cultural farming. In 2015, compared to the previous year, while areas dedicated to organic agriculture (including natural harvesting areas) decreased by 39%, amount of production increased by 11%.

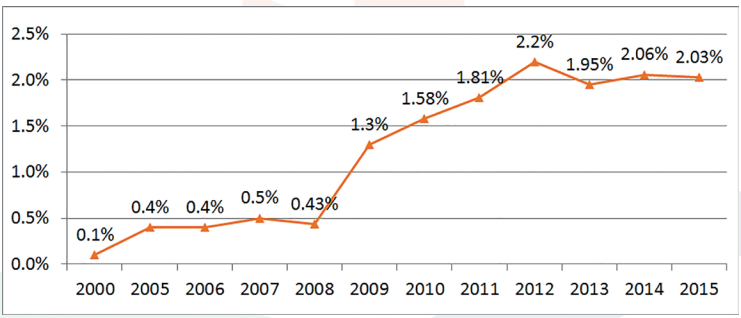
For 2015, the share of organic farming in total agriculture land is 2%. It is aimed to increase this number to 3.5% by 2017, and 5% by 2023. In 2014, 1% of the world's total agricultural lands and 5.7% of EU countries' total agricultural lands was dedicated to organic agriculture [61].

GRAPH 97- TOTAL ORGANIC FARMING AREAS AND PRODUCTION AMOUNT BY THE YEARS



Source: Ministry of Food, Agriculture and Livestock.
Notes: (1) Transition period included. (2) Wild production areas are included.

GRAPH 98- THE SHARE OF ORGANIC FARMING LAND IN TOTAL AGRICULTURE LAND (%)



Source: Ministry of Food, Agriculture and Livestock

12.5- Good Agricultural Practices

D P S I R

Good agricultural practices is an agricultural production which is not harmful to enviroment, human and animal health. With these practices provide protection of natural resorces, tracebility and sustainability in agriculture and food safety. In this regard, the indicator is a response indicator.

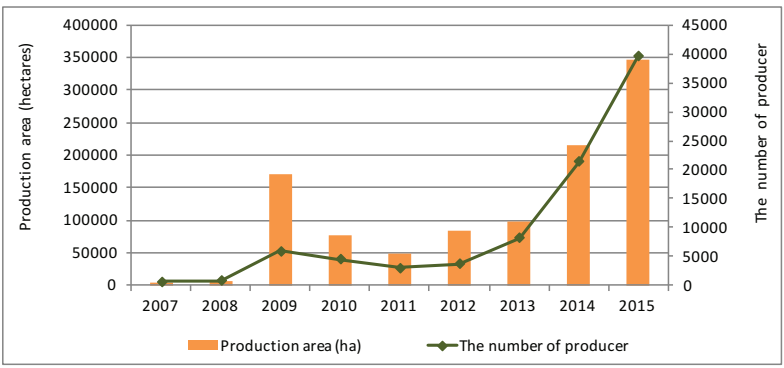
Good Agriculture Practices is carried out according to good agricultural practices publishing legislation by Ministry of Food, Agriculture and Livestock. Therefore, production has to be traced from the soil to the dining table, and every step has to be recorded. Pesticide, fertilizer and etc. should be used according to the results of analyses and be kept under control. The last product is certificated by the report given by the control institution.

In Turkey, Good Agricultural Practices Certificate started to be given in 2007. In 2007, 149,693 tons of production amount has been reached in an area of 5,361 hectares of land. In 2015, 3,271,239 tons of the production amount has been reached in an area of 346,570 hectares.

TABLE 43- GOOD AGRICULTURAL PRACTİCES BETWEEN 2007 AND 2015

	The Number of Province	Producer Number	Production Area (da)	Production Amount (tonnes)
2007	18	651	5.361	149,693
2015	61	39,740	346,570	3,271,239
% Changes (2007-2015)	239	6,004	6,365	2,085

GRAPH 99- GOOD AGRICULTURAL PRACTICES PRODUCTION AREAS AND PRODUCER NUMBER BY THE YEARS



Source: Ministry of Food, Agriculture and Livestock

In 2015, good agriculture producers number increased by 86.3% and production area increased by 61.4% compared to 2014, while production amount decreased by 21.2%. Every year we aim at increasing 20% production area of GAP. It is the way that GAP spread all our agricultural land [61].

13.1- Aquaculture Production

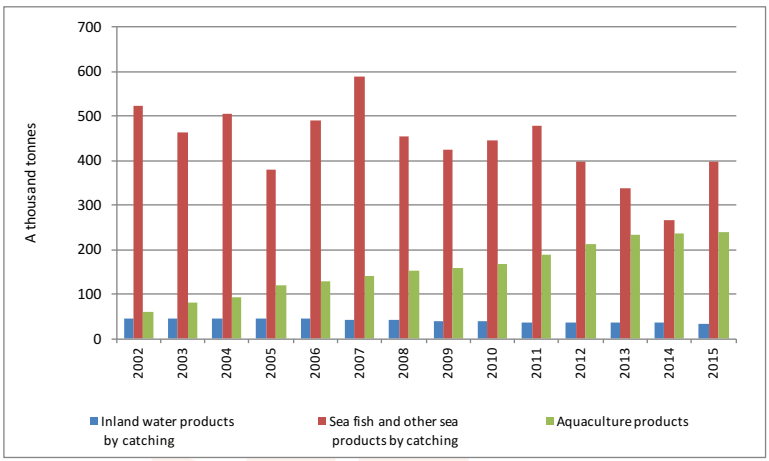
This indicator is a pressure indicator.

There is 24 million ha of sea area and 1 million ha of inland water area in Turkey. Based on the TURKSTAT data; in 2015, fishery production increased by 25.1% in 2015 with respect to the previous year and occured as 672 thousand 241 tonnes. The total fishery production was composed of sea fish by 51.4%, other sea products by 7.7%, inland water products by 5.1% and aquaculture products by 35.8%.

In 2015, capture of fishery products increased by 42.9% and aquaculture increased by 2.2% respect to the previous year. While the production made by capture was 431,907 tonnes, aquaculture production occurred as 240,334 tonnes.

While the capture of seafood increasing by 49.5%, capture of inland fisheries decreased by 5.4% with respect to the previous year. 42.2% of the amount of aquaculture production took place at the inland waters and 57.8% at the seas.

GRAPH 100- AQUACULTURE PRODUCTION DATA BY THE YEARS



Source: Ministry of Food, Agriculture and Livestock, TURKSTAT

Within all the production of marine products by capture, East Black Sea Region was the first by the ratio of 60.8%. The regions West Black Sea by 19.8%, Aegean by 8.9%, Marmara by 8% and Mediterranean by 2.5% followed this region [63].

To protect fisheries resources and provide sustainability, regulations regarding zones, season, size, species, distance, depth and equipment related to fishing are issued. Activities such as monitoring of fish stocks, protection of endangered species, replenishing of the fish stocks and monitoring and mitigation of water pollution are performed [64].

13.2- Fishing Fleet Capacity

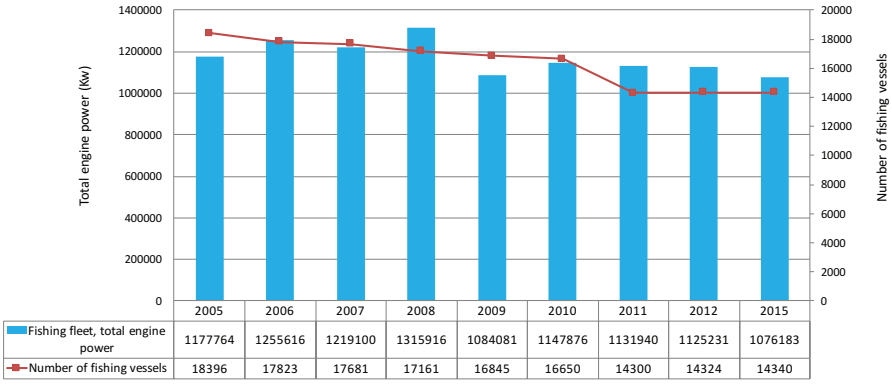
D P S I R

Indicator is the measurement of the size and capacity of the fishing fleet that is assumed to have a pressure on fishlife and environment.

It is known that neither in the world nor in Turkey, the amount obtained by hunting will not increase significantly. For this reason, the basic approach accepted by scientists in hunting is to maintain production while preserving stocks [64]. Fishing fleet of Turkey has grown and developed regarding power, amount, technology and fishing tools until the years 2000. According to TURKSTAT data, while in 2000 number of the fishing vessels was 13,381, this increased to 18,396 in 2005, but reduced to 14,340 in 2015.

The size of the fishing fleet has been limited by denying licenses for new vessels since 2002. Moreover, in order to reduce the fishing pressure over the resources, considering the balance between the fish seafood stocks and fishing fleet, subsidies according to the vessel size is made to those who cancel their licenses and stop fishing [64].

GRAPH 101- FISHING FLEET, TOTAL ENGINE POWER KILOWATTS (Kw) AND NUMBER OF FISHING VESSEL LICENSES OVER THE YEARS



	2005	2006	2007	2008	2009	2010	2011	2012	2015
Fishing fleet, total engine power	1177764	1255616	1219100	1315916	1084081	1147876	1131940	1125231	1076183
Number of fishing vessels	18396	17823	17681	17161	16845	16650	14300	14324	14340

Source: TURKSTAT

14.1- The Number of Tourists

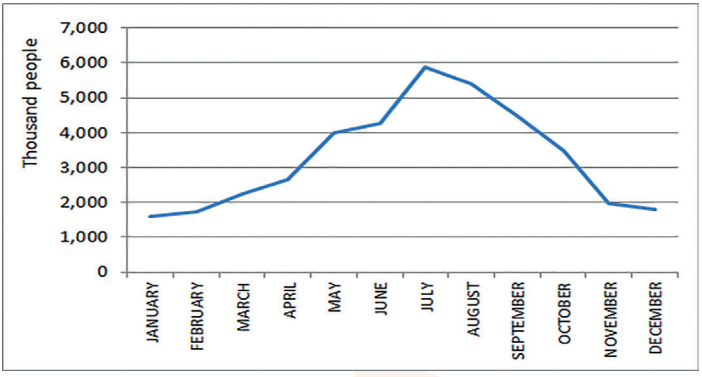
D P S I R

Number of visitors to Turkey within a particular time puts pressure on the environment due to extensive consumption of natural resources in that period, besides wastewater, waste, noise, etc.

The number of tourists is found by subtracting the number of daily tourists from the total of foreign visitors and the visiting Turkish citizens residing abroad.
In 2003, 15,774,505 tourists visited Turkey, and this number increased to 39,478,374 in 2015. The number of tourists in 2015 compared to 2014 decreased by 0.84%.

When the distribution of tourists visiting Turkey by months is considered, it is seen that tourists visited the country mostly in summer. In summer while water resource capacities are at minimum level, increasing water consumption per capita in touristic facilities bring about environmental problems related with water. Drawing an excessive amount of water from deep water wells is also a risk which increases the water problem.

GRAPH 102- MONTHLY DISTRIBUTION OF TOURISTS VISITING TURKEY IN 2015



GRAPH 103- 2003-2014 PERIOD NUMBER OF TOURISTS

Source: http://yigm.kulturturizm.gov.tr/TR,9854/sinir-giris-cikis-istatistikleri.html

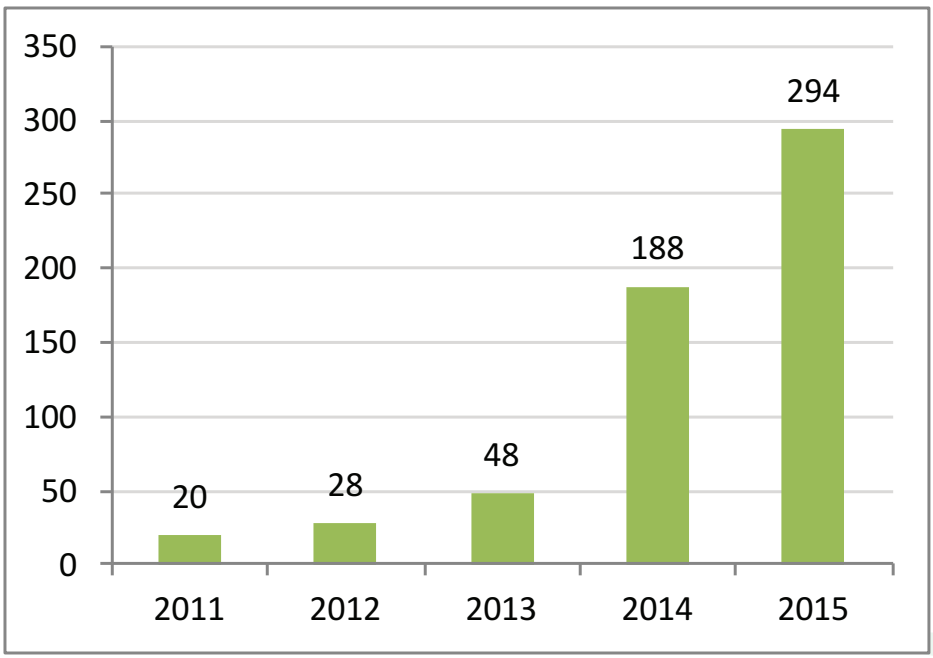
14.2- Number of Environment-Friendly Accommodation Facilities

D P S I R

This is a response indicator. In order to protect the environment, increase environmental awareness and promote contributions by the tourism operators to the environmental compliance activities, Ministry of Culture and Tourism grants the certificate and badge of "Environment-Friendly Accommodation Facility" (Green Star) to the accommodation facilities that have "Tourism Facility Certificate" and perform environment friendly activities. Ministry of Culture and Tourism provides a partial subsidy of the electricity expenses of the certificate owners.

As of the end of 2015, number of the facilities with the "Tourism Facility Certificate" was 3,319 with a bed capacity of 848,788. 294 of these (8.9 %) possess "Environment-Friendly Accommodation Facility" certificate (Green star badge).

GRAPH 104- NUMBER OF GREEN STAR CERTIFICATED ACCOMODATION FACILITIES OVER THE YEARS



Source: Ministry of Culture and Tourism

14.3- Tourist overnights and bed capacity per 1000 Inhabitants

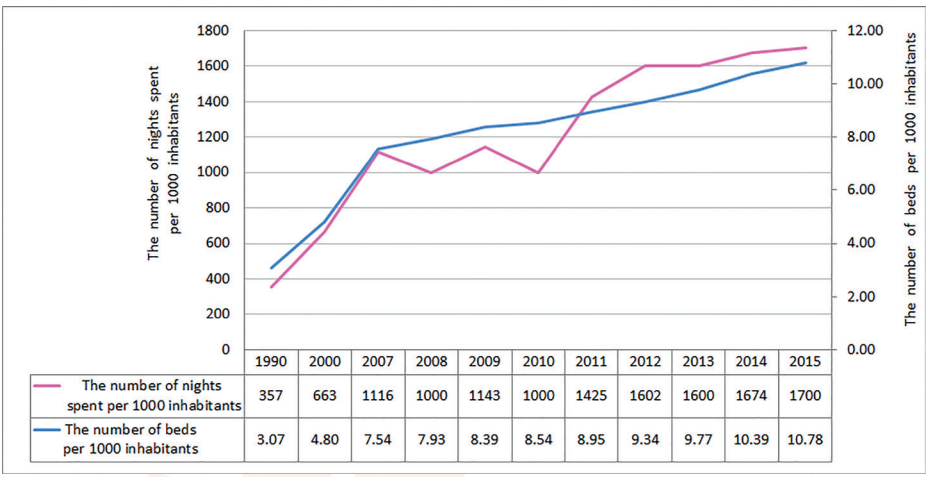
D P S I R

This pressure indicator is obtained by dividing the total overnight stays in the tourism facilities and the total bed capacity of the certificated tourism facilities by total population; expressed as per 1000 people.

Increasing tourist number may have adverse effects on environment especially in a region within particular time period by excessive consumption of resources (water use, waste generation) causing serious environmental problems.

The number of bed per 1000 inhabitants in Turkey with tourism facility certificate has increased steadily over the years. Both figures show a general increasing trend in years; while tourist overnights per 1000 inhabitants show fluctuations in some years.

GRAPH 105- TOURIST OVERNIGHTS AND BED CAPACITY PER 100 INHABITANTS



	1990	2000	2007	2008	2009	2010	2011	2012	2013	2014	2015
The number of nights spent per 1000 inhabitants	357	663	1116	1000	1143	1000	1425	1602	1600	1674	1700
The number of beds per 1000 inhabitants	3.07	4.80	7.54	7.93	8.39	8.54	8.95	9.34	9.77	10.39	10.78

Note: *One most consider which that total number of accommodation establishments and beds currently differs from on a statistical year to another which will be reflected in the final number of overnights and tourist arrivals.*

Sources: *The number of nights spent and beds datas for Ministry of Culture and Tourism, population datas for TURKSTAT.*

According to EUROSTAT data, there were an estimated average of 27 bed places in hotels and similar establishments in the EU-28 and 1662 nights spent by non-residents per 1000 inhabitants in 2013 [66].

14.4- Blue Flag Implementations

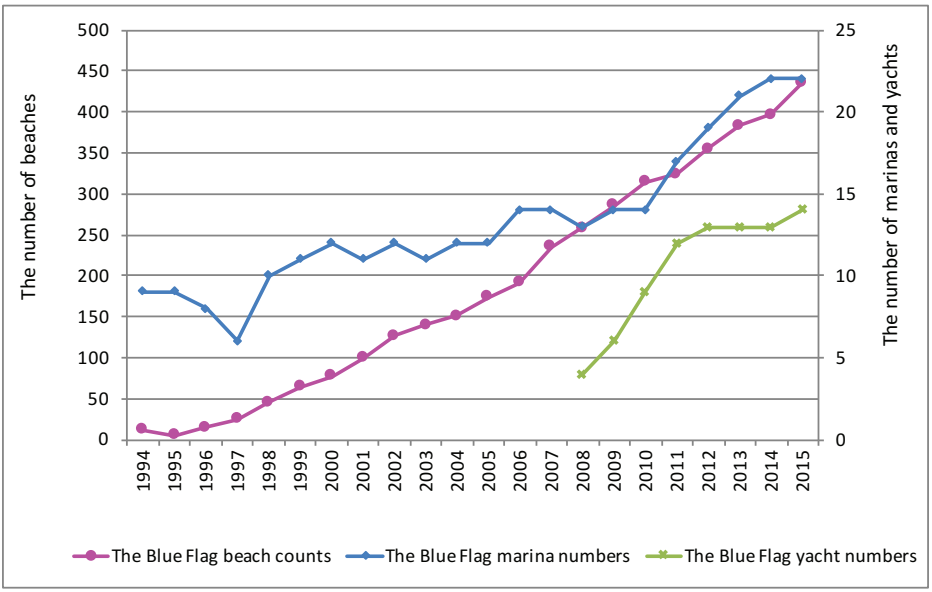
D P S I R

This indicator is a state indicator. Blue Flag is an international environmental award given to beaches and marinas having reached to a standard stated in the criteria. Blue Flag applications which began in 1987 in Europe and in 1993 in Turkey, aim to establish high standards in beaches and marinas.

In the period from 1994-2015, the number of Blue Flag in Turkey increased steadily and reached to 436 beaches, 22 marinas and 14 yachts in 2015.

In our country, the scope of Blue Flag Programme carried out under the coordination of Turkey Environment Education Foundation (TÜRÇEV), our country ranks second with 436 beaches, followed Spain (578) in 2015. As for marinas, Turkey ranked 7th in the World.

GRAPH 106- THE NUMBER OF BLUE FLAG BEACHES , MARINAS AND YACHTS BY YEARS IN TURKEY



Source: Turkey Environment Education Foundation

15.1- Forest Fires

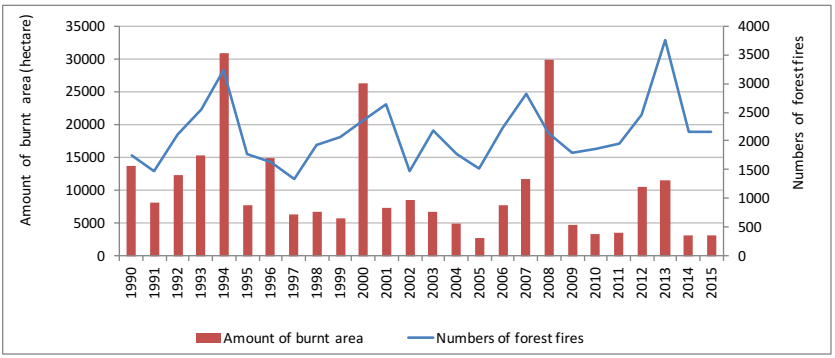
D P S I R

This indicator is a state indicator. The majority of the forests located in Turkey, which is in the Mediterranean climate zone, are under the threat of forest fires. In 2015, 2,150 forest fires occurred, and in average 3,219 ha of forest area were damaged. 1.5 hectar area was damaged in average per incident of fire. In 2015, the number of fires compared to the previous year increased by 3.3%. Burnt forest area was almost the same as the previous year.

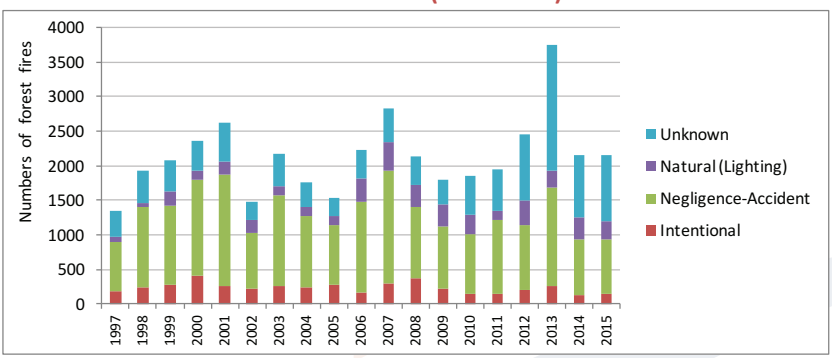
The majority of the forest fires are caused by people. Cause of the 45% of forest fires in 2015, could not be specified. 37% of fires caused by negligence-accidents, 12% by natural causes and 6% by intention.

85% of forest fires in terms of both numbers and the area occurred between June and October which is the period when the risks are at their peak [67].

GRAPH 107- FOREST FIRES (1990-2015)



GRAPH 108- CAUSES OF FOREST FIRES (1997-2015)



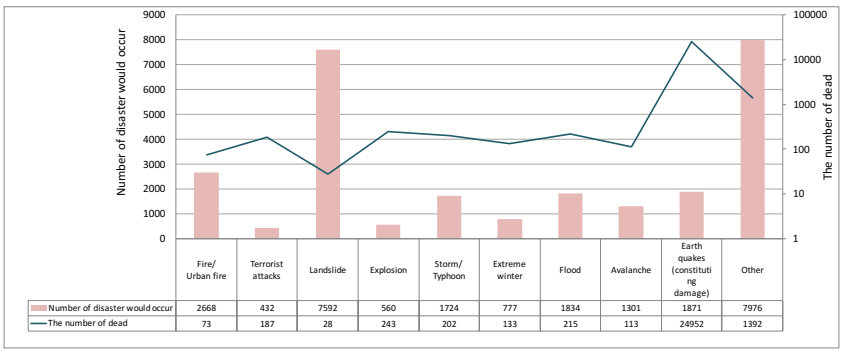
Source: Ministry of Forestry and Water Affairs, General Directorate of Forestry
http://www.ogm.gov.tr/ekutuphane/Sayfalar/Istatistikler.aspx

15.2- Disasters by Types

Natural disasters are impact indicators and technological accidents are pressure indicators. According to Natural Disaster Archive Data Bank of Turkey (TABB), 26,735 disasters occurred between 1990 and 2015 (highway/vehicle accidents except). When disaster numbers have been evaluated between 1990 and 2015, it was seen that landslides took the first place by 7592 (28.4%). This was followed by 2668 (10%) urban fires and other fires, 1871 (7%) earthquakes (constituting damage).

27,538 people have lost their lives between 1990 and 2015 by disasters occurred in Turkey (highway/vehicle accidents not included). The highest death occurred by earthquakes (constituting damage) with the number of 24,952 (90.6%).

GRAPH 109- TYPE AND THE OCCURANCES OF DISASTERS AND THE NUMBER OF DEATH ACCORDING TO NATIONAL DISASTER ARCHIVE DATA BANK OF TURKEY (TABB) BETWEEN 1990-2015



	Fire/ Urban fire	Terrorist attacks	Landslide	Explosion	Storm/ Typhoon	Extreme winter	Flood	Avalanche	Earth quakes (constituting damage)	Other
Number of disaster would occur	2668	432	7592	560	1724	777	1834	1301	1871	7976
The number of dead	73	187	28	243	202	133	215	113	24952	1392

Source: https://tabb.afad.gov.tr

15.3- Number of Risk Assessment and Emergency Response

Coastal Facilities which are executing activities leading pollution of seas have to prepare and submit “Risk Assessment and Emergency Response Plans” within the scope of The Law numbered 5312 “Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances” and “Implementation Regulation of related Law”. In this context, Risk Assessment and Emergency Response Plans of 291 Coastal Facilities have been prepared and approved by Ministry of Environment and Urbanisation. This number constituted the 90% of all the coastal facilities in Turkey. Plan includes; risk assessment of coastal facility, emergency response to marine pollution with necessary equipment & personnel, preventive measurements for environment and habitat, damage identification and compensation systems, and rehabilitation processes.

1 national and 6 regional emergency response plans have been prepared and entered into force on 08.02.2012 by the Ministry of Environment and Urbanisation in order to create an emergency response system at the national and regional level, facilitate coordination and cooperation and ensure effective use of public and private resources and protection of the marine environment. Studies to keep the plans up-to-date are carried out every year. The risk assessment and emergency response plans of the coastal facilities prepared are the sub-elements of the national and regional plans.

TABLE 44- THE RATIO OF COASTAL FACILITIES AMONG THE FACILITIES WHOSE PLANS WERE APPROVED BY THE MINISTRY OF ENVIRONMENT AND URBANISATION

CITIES	YEARS						
	2009	2010	2011	2012	2013	2014	2015
ADANA	75%	75%	83%	83%	83%	91%	100%
ANTALYA	7%	36%	36%	43%	43%	75%	88%
ARTVİN	0%	50%	50%	50%	100%	100%	100%
AYDIN	0%	0%	0%	0%	0%	0%	50%
BALIKESİR	10%	20%	20%	30%	30%	43%	43%
BARTIN	0%	0%	0%	0%	0%	25%	40%
BURSA	20%	60%	60%	60%	60%	86%	86%
ÇANAKKALE	13%	25%	25%	38%	50%	67%	83%
DÜZCE	100%	100%	100%	100%	100%	100%	100%
EDİRNE	0%	0%	0%	0%	0%	0%	0%
GİRESUN	0%	40%	40%	40%	40%	100%	100%
HATAY	14%	81%	86%	86%	90%	90%	95%
İSTANBUL	4%	81%	82%	84%	84%	93%	94%
İZMİR	65%	79%	79%	79%	81%	95%	100%
KASTAMONU	0%	0%	0%	0%	0%	0%	33%
KIRKLARELİ	0%	0%	0%	0%	0%	0%	0%
KOCAELİ	25%	63%	78%	85%	85%	95%	100%
MERSİN	44%	68%	76%	80%	80%	91%	91%
MUĞLA	0%	4%	4%	12%	12%	57%	71%
ORDU	0%	14%	14%	14%	14%	60%	60%
RİZE	7%	7%	7%	7%	7%	100%	100%
SAKARYA	0%	0%	0%	0%	0%	0%	0%
SAMSUN	11%	67%	78%	89%	89%	90%	91%
SİNOP	0%	0%	0%	0%	0%	0%	0%
TEKİRDAĞ	25%	42%	50%	67%	75%	75%	92%
TRABZON	0%	8%	15%	23%	23%	60%	67%
YALOVA	7%	7%	7%	21%	21%	98%	98%
ZONGULDAK	40%	60%	80%	80%	100%	100%	71%
Total	**21%**	**52%**	**56%**	**60%**	**62%**	**85%**	**90%**

Source: Ministry of Environment and Urbanisation, General Directorate of Environmental Management

	Amount of water abstracted by sectors (Billion m3/year)								Amount of wastewater discharged to environment by sectors (Billion m3/year)							
YEARS	**2008**		**2010**		**2012**		**2014**		**2008**		**2010**		**2012**		**2014**	
	Amount	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**	**Amount**	**(%)**
Municipalities	4.56		4.79	9.6	4.93	8.8	5.23	10.3	3.11		3.50	38.5	3.90	32.4	4.11	32.4
Villages	1.22		1.01	2.0	1.04	1.9	0.43	0.8	0.20		0.19	2.1	0.19	1.6	0.11	0.9
Manufacturing İndustry establishments	1.20		1.50	3.0	1.67	3.0	2.20	4.4	0.84		1.04	11.4	1.36	11.3	1.72	13.5
Thermal power plants	4.54		4.27	8.6	6.40	11.5	6.53	12.9	4.44		4.16	45.8	6.30	52.3	6.40	50.5
Organized Industrial zones	0.11		0.11	0.2	0.12	0.2	0.14	0.3	0.13		0.16	1.8	0.20	1.7	0.21	1.7
Mining establishments	...	...	0.05	0.1	0.11	0.2	0.21	0.4	...		0.04	0.5	0.10	0.8	0.14	1.1
Irrigation	33.77		38.15	76.5	41.55	74.4	35.85	70.9								
Total			**49.89**	**100**	**55.81**	**100**	**50.59**	**100**			**9.10**	**100**	**12,05**	**100**	**12,68**	**100**

Note: Water transferred between sectors is not included. ... Data not available.
Sources: "Watering" figures; Source: Ministry of Forestry and Water Affairs General Directorate of State Hydraulic Works (DSİ), Source: TURKSTAT

Waste generation by sectors (1000 tonnes/year)								
YEARS	2008		2010		2012		2014	
	Total Waste Amount	Amount of Hazardous Waste İn Total Waste Amount	Total Waste Amount	Amount of Hazardous Waste İn Total Waste Amount	Total Waste Amount	Amount of Hazardous Waste İn Total Waste Amount	Total Waste Amount	Amount of Hazardous Waste İn Total Waste Amount
Municipalities	24,361	-	25,277	-	25,845	-	28,011	-
Manufacturing industry establishments	12,482	1,136	13,366	964	14,420	806	15,733	1,008
Thermal power plants	25,622	24	18,748	(**)	19,262	5	24,191	9
Organized industrial zones	255	34	313	(**)	421	62	533	32
Mining establishments	,,,	,,,	729,750(1)	2,314	951,782(1)	3,181	755,218(1)	2,355
Health institutions	50	50	60	60	69	69	74	74
Total			**787,514**		**1,011,800**		**823,762**	

Source: TURKSTAT

(**) According to the Law no. 5429 privacy policies, data on units could not be given for the number of units three or more or two units dominated.

... Data not available.

(1) Includes overburden and tailings waste from mining activities

(2) The health institutions listed in annex-1 of Medical Waste Control Regulation that are producing waste in large quantities (university hospitals and their clinics, general hospitals and their clinics, maternity hospitals and their clinics, and military hospitals and their clinics) are covered.

POPULATION

Population Growth Rate
Indicator shows the average annual increase of the population rate during a specific period or year. Growth rate is expressed as annual population increase for every 100 inhabitants.

Urban Population
Indicator shows the percentage of the population in provincial and district centres and within municipal boundaries in total population.

Migrant Population
Internal migration is defined as changes in usual residence addresses of population within one year in the specific areas inside the country.

ECONOMY

Environmental Protection Expenditure
Environmental protection expenditure is the money spent on all purposeful activities directly aimed at the prevention, reduction and elimination of environmental pollution originating from production processes and consumption of goods and services. For the public sector administrative, monitoring, and enforcement expenditure are included. Environmental protection includes both abatement of and protection from pollution, and activities related to environmental degradation. Primary aim of the activities in this section is environmental protection. Actions which have a favorable impact on the environment but which serve primarily other goals do not come under environmental protection. In addition, activities performed for technical reasons, hygiene or security and provide environmental benefits are not included.

Sectoral Distribution of the Employment
It indicates the percentage of the active population of agriculture, industry, construction and service sectors in the total active population.

CLIMATE CHANGE

Greenhouse Gas Emissions
These emissions comprise of direct greenhouse gasses, such as: carbon dioxide (CO_2), methane (CH_4) , nitrous oxide (N_2O) , hydro fluorocarbons (HFCs) and

sulphur hexafluoride (SF6) and indirect greenhouse gases such as nitrogen oxides (NO_x) , non-methane volatile organic compounds (NMVOCs) and carbon monoxide (CO) emissions that are generated by energy, industrial processes and product use, agricultural activities and emissions from waste disposal. National Greenhouse Gas Emissions are calculated by using the guidelines of 2006 Intergovernmental Panel on Climate Change (IPCC).

Greenhouse Gas Emissions by Sectors

Indicator refers to the amount of the greenhouse gas emissions caused by different sectors and expressed as CO_2 equivalent.

Precipitation

The expression describes the average precipitation per unit area.

Temperature

This indicates monitoring of the average surface temperature in time series.

Sea Water Temperature

This indicates the yearly change of the sea water surface temperature in time series.

AIR POLLUTION

Air Pollutant Emission

Emissions of air pollutants is the expression for particular pollutants that is obtained by multiplying annual activity data with the emission factors and expressed as total mass (Kilotonnes, Gigagrams, etc.) per year.

Air Quality

This indicator; shows the mass concentrations of SO_2 and Particulate Matter (PM) in the ambient air. SO_2 is a suffocating, colourless and acidic gas which mostly arises from generation of sulphurous compounds that are naturally present in the fuel substances during combustion of fuels. Particulate Matter (PM) is a mixture of solid particles and liquid droplets suspended in the atmosphere. It comes in a variety of sizes and can be composed of many types of materials and chemicals. PM could also be formed by the agglomeration and the chemical conversion of the gaseous emissions. Particles between 5 to 10 micrometre diameter is defined as suspended particles. Overall, SO_2 involves heterogeneous mixtures and their characteristics vary considerably from one location to another. Particulate Matters are called PM_{10} if the aerodynamic diameter of the particles is less than 10 micrometres.

Limit value: A level fixed on the basis of scientific knowledge, with the aim of avoiding, preventing or reducing harmful effects on human health and/or the environment as a whole, to be attained within a given period and not to be exceeded once attained.

WATER-WASTEWATER

Water Usage

This indicates the amount of total water which is drawn from the sources in a sectoral base such as municipality, irrigation, drinking and utilization and industry.

Oxygen Consuming Substances in Rivers

The primary indicator of oxygen concentration in water bodies, is expressed as biochemical oxygen demand (BOD)—which is the amount of dissolved oxygen required for the aerobic decomposition of organic matter present in water. This indicator also shows the present state and trends of ammonium (NH4) concentrations and BOD in rivers.

Nutrients in Fresh Water Sources

Indicators can be used to show geographical variations in current nutrient concentrations - orthophosphate and nitrate concentrations in rivers, total phosphate and nitrate in lakes and nitrate in underground water formations - and temporal trends.

Bathing Water Quality

This indicates bathing water quality in the coastal areas. According to By-law on Bathing Water Quality, following qualities represent Class A: Very Good/ Excellent, Class B: Good Quality, Class C: Bad Quality and Class D: Very Bad Quality/Needs to be Banned.

Drinking and Potable Water Resources of Municipalities

This indicates the rate of the water drawn from dams, wells, natural springs, rivers, lakes and ponds by the municipalities for the consumption as drinking and potable water usage.

Municipalities Served by Wastewater Treatment Unit

This shows the number of the municipalities providing service with the wastewater treatment plant and the population that is benefited from this service.

Wastewater Treatment is one or a combination of physical, chemical or biological processes in which the substances in wastewater are partially removed and partially changed by decomposition from complex highly putrescible organic solids to mineral or relatively stable organic solids. The extent of this change depends on the treatment processes involved. After all treatment processes are completed, it is still necessary to dispose the liquid and the solids that are removed.

Wastewater Treatment Plants: Wastewater treatment plants are units in which water pollutants removed from wastewater by using different methods (biological, chemical, physical)

Treatment Methods

- Physical Treatment: Physical methods are the processes by which the undissolved pollutants are separated from the wastewater by sedimentation or floatation. The most common physical treatment units are; screens, sieves, sand traps, balancing and sedimentation and floatation ponds.

- Chemical Treatment: In chemical treatment by using chemicals like coagulants and polyelectrolytes, substances dissolved or suspended in wastewater are separated.

- Biological Treatment: In this method microorganisms are used to eliminate dissolved organic substances in the wastewater which cannot be removed by physical or chemical methods. Some biological treatment methods can be mentioned as trickling filter, activated sludge, stabilization tank (oxidation tank).

- Advanced Treatment: It is the treatment method applied when physical and biological treatment methods are not capable to remove sufficiently or to remove at all, the pollutants such as nitrogen, phosphorous, heavy metals, toxic organic substances, etc.. Some of the advanced methods are; nitrification, denitrification, adsorption, ion exchange, etc.

- Natural Water Treatment System: Sedimentation of pollutants in artificial wetlands and treatment of wastewater by plants which can live in this kind of environment.

The Population Combined to at least Secondary (Biological) Wastewater Treatment Plant

It is the information of the percentage of the population whose wastewater is treated by at least secondary wastewater treatment.
Therefore, urban wastewater is treated usually by biological treatment or similar processes with secondary sedimentation. In this way, biochemical oxygen demand in wastewater (BOD) is reduced to at least 70%, and chemical oxygen demand (COD) to 75%.

WASTE

Municipal Waste and Disposal

This indicator shows the amount of the waste collected by the municipalities or on behalf of municipalities and the amount of the landfilled municipal waste. waste generated in the houses are the most significant quantity of the municipal waste. It also includes the waste generated by the trade and commercial companies, office buildings, institutions and small workplaces.

Landfills

Landfillss are the areas in which the waste are disposed according to certain technical standards except for the services in which the waste are stored in the interim storages less than 1 year for disposal, facilities in which the waste are stored in interim waste storages less than 3 years for recovery or pre-treatment and the units in which the waste are stored in temporary waste storages for disposal or pre-treatment or recovery in the facility where the waste are generated. This indicator contains information about the number of landfills and the rate of population the service is provided to.

Medical Waste

It indicates the amount of medical waste produced and the number of disposal/ sterilization facility according to years.

Waste Oils

This indicator expresses the amount of collected oil which is used, from the gasoline engine, diesel engine, transmission and differential box, transmission, grease and other private vehicle oils and hydraulic system, turbine and compressor, slide, open-closed gear, circulation, metal cutting and processing, textile, thermal processing, heat transfer, isolation and protection, isolation, transformer, molding, steam cylinder, pneumatic system protector, food and medicine industry, paper machine, bed and other industrial oils and industrial greases, used thickeners, protective, cleaning and other similar preparations and oil products which are not appropriate for use.

Waste Vegetable oils

This indicates the total amount of collected vegetable oils which are soap-stocks from refinery industry (residue formed during the removal of the fatty acids from raw oil using the base), tank bottom residues, oiled soils, used frying oil, oils from the oil separators of various facilities and expired vegetable oils.

Waste Batteries and Accumulators

It shows the collected amount and recovered amount of the used batteries and accumulators which are required to be collected, transported and disposed separately from household waste.

Packaging Waste

It contains the information about the amounts and recovered amounts of the sale, secondary and transportation packaging left to environment including the ones used for the presentation of the product during the process of transfer of goods to the end user or the consumer and which are expired and formed after the usage and are reusable other than generated waste.

Economic Facilities

It includes the packaging producers, merchandisers and suppliers.

End of Life Tires

This indicates the amount of end of life tires that are used as additional fuel in recovery facilities or cement factories

End of Life Vehicles

This indicates the number of the scrapped vehicles through the years.
Waste Electrical and Electronic Equipment This indicates the amount of waste electrical and electronic equipment collection and the number of treatment facilities.

Mining Waste

This indicates the waste determined by the result of the questionnaire surveys made in the mining facilities such as coal and lignite, metal ore mining, mining and quarries and other sectors with supportive activities which employ 10 or more people.

Hazardous Waste

It includes the information about the amount and recovery quantities of the waste which have the properties of being explosive, flammable, self-combustible, exhaling flammable gases when in contact with water, oxidizing,

containing organic peroxide, poisonous, corrosive, exhaling toxic gases when they are in contact with water or air and toxic and ecotoxic properties.

Amount of Ship Waste

It includes all the waste and loads produced during the normal activities of a vessel including the sewage within the scope of MARPOL 73/78 APPENDIX-I, APPENDIX -IV and APPENDIX -V', and all other waste apart from the weight and load residues described in Convention of MARPOL 73/78 APPENDIX -V application.

LAND USE

Distributions of General Land Cover

According to the CORINE project (Coordination of Information on the Environment) use types are divided into two.

1. Land Cover: It shows the state of the land covered with biological and physical elements such as, natural maquis, shrub lands, natural cliffs and natural pastures etc.

2. Land Use: It describes the land use occurring by human effect. This indicator shows a comparison between the land use changes and proportional indication of land use types determined according to Coordination of Information on the Environment-CORINE project.

Land use categories identified according to CORINE are:

1. Artificial Areas: Most of these areas are covered with buildings and transportation network.

2. Agricultural Areas: Both tamed agriculture lands and pasture areas are placed under this headline.

3. Forest and Semi-natural Areas: They are the areas consisting of forests, marquis, herbaceous plants and non-planted and less planted open areas.
4. Wetlands: These are areas which stay wet ecologically from the coastal line to the land side and all the water, marshes, reeds and peatland which do not exceed six meters during the tide movements of the seas, fresh, brackish or saline, still or flowing, continuous or temporary, natural or artificial and which are important as the habitats of living things especially water birds.
5. Water Bodies: It includes the water bodies such as the continental waters

(stream surfaces) and sea waters (lagoons, bays, sea and oceans).

MisUse of Agricultural Areas

It means giving permission to the lands that have the agricultural land property into use out of purpose within the law and by-laws.

Zones under Threat of Erosion

Erosion is the movement of soil from its natural environment by certain influences such as water flow, wind or gravity. Although it is a natural event, it becomes stronger with the influences such as water flow, wind and gravity with the result of deterioration of the natural structure of the land. In Turkey, several types of erosion are observed. Water erosion is the most common erosion type in the Turkey. This indicator is shown together with the strength of erosion occurring in agricultural areas, forests and meadows.

BIOLOGICAL DIVERSITY

Biological Diversity

Biological diversity is the unity of genes, species, ecosystems and ecological events in a particular area. In other words, biological diversity contains the whole genes in a certain area, the species carrying these genes, the ecosystems home for these species and all the events (processes) which bind these together.

Protected Areas

These areas are the areas protected according to the description by International Union for Conservation of Nature (IUCN) updated in 2008. It is the area which is managed by legal and other effective methods, having geographical borders clearly described and dedicated for the purpose of protection of the nature and related ecosystem services and cultural values in the long term.

Forest Area

It is the size of the area of the forest covered in a certain closure on the hectare scale.

Normal Forest (Productive)

They are forests where the trees crown cover 11-100% of the hill tops.

Degraded Forest

They are forests where less than 10% of the tops of the trees crown cover the area.

Tree Growing Stock

The chest diameter is 8 cm and the sum of the body volumes of the bodied shells in the m3-stitched shell.

Definitions Related with Forestry Studies;

Functional Forestry

This indicator represents the areas which are reserved for the total timber production, nature conservation, erosion prevention, hydrological, aesthetic, ecotourism and recreation, climate protection, public health, national defence and scientific use in the total forested area.

Tree Growing Stock

It is the sum of the body volume of cylindrical body-shell trees (m3) that have at least 8 cm or more chest diameter.

Range Rehabilitation

It involves activities like irrigation, fertilization, weed control, seeding, planting, tree planting and other biological techniques to increase the feed efficiency of the meadows and pastures in terms of quality and quantity; and the construction of plants facilitating grazing and the application of a variety of physical, technical and administrative measures in order to maintain soil.

Rehabilitation

This indicates the steps that include protection, fertilization, and pruning of existing species in degraded or unproductive forest areas and planting species that grow naturally in forests, including the plantation of grafted or non-grafted seedlings of these species.

Erosion Control

This includes the studies involving the precautions taken against erosion and removal of soil on the earth bedrock because of several factors.

Artificial Regeneration

This indicates soil processing, weed cleaning and wire embracing works by the help of machinery and manpower.

Private Afforestation

This indicates the afforestation projects permitted and approved by the Ministry of Forestry and Water Affairs, in the degraded forest areas, legal entities of the public domain and owned land in the villages, municipalities, associations, foundations, chambers, the related entities that wood and harvesting belongs to commercial companies that are legal entity and natural entities.

INFRASTRUCTURE AND TRANSPORT

Highway Railway Network
This indicates development and the length of total roads (highways, state roads, province roads) and railroads

The Amount of Freight and Passengers Carried by Transport Types
This indicator shows distribution by percentage among transport types for the freight and passengers in the country.

Number of Road Motor Vehicles
It indicates the total number of road motor vehicles such as automobiles (including off-road vehicles), minibuses, autobuses, vans, trucks, and motorcycles, special purposed vehicles, road and work machines and tractors.

ENERGY

Primary Energy Consumption byFuel Type
Total energy consumption or gross domestic energy consumption represents the amount of energy required to meet the domestic consumption of a geographical entity. The supply from solid fuels, oil, gas, nuclear energy, and renewable sources is calculated as the sum of gross domestic energy consumption. The relative contribution of a particular fuel is measured by the ratio between energy consumption from this fuel and the total gross domestic energy consumption in a calendar year.

Primary Energy Consumption Per Capita
The total energy intensity is the gross energy consumption (or total energy consumption) per capita.

Total Energy Consumption by Sectors
This shows the total energy consumption of the residences, industries, transportation, agriculture, non-energy, conversion sectors with the petroleum equivalence.

Primary Energy Production
It explains the amount of energy supplied from solid fuels like coal and wood, petroleum, gas and renewable sources and the ratio of each resource to total energy production.

Energy Dependence

Energy dependence indicates to what extent the country is dependent on imports in order to meet the energy needs of an economy. The indicator is obtained by dividing net imported energy to the sum of gross domestic energy consumption and the sum of bunker fuel.

The Share of Renewable Energy Sources in Gross Final Energy Consumption

This indicator shows the rate of total energy consumption obtained from renewable energy sources (wood, animal and plant residues, hydraulic, geothermal, wind and solar). Renewable energy sources correspond to current external flow of energy or energy obtained from materials derived from them.

The Primary and Final Energy Intensity

The ratio of the primary energy consumption to the GDP is considered as primary energy intensity, the ratio of the the final energy consumption to the GDP is considered as final energy intensity.

Total Energy Consumption

It is the amount of energy sources that the enterprises consume ultimately, the conversion process and non-energy.

The amount of final energy that enterprises use to produce goods and services, for space heating and transport purposes.

Energy Consumption in Conversion Processes

It is the amount of energy that enterprises consume in electricity generation, heat production, and in coke oven / blast furnace.

Non Energy Consumption

It is the amount of energy that enterprises consume an energy source not for energy purpose but as raw material etc.

INDUSRY AND MINING

Environmental Impact Assessment (EIA)

EIA contains the determination of the positive and negative impacts of the planned projects on the environment, preventing the potential negative impacts and in determining the technological alternatives to minimize the negative impacts with the chosen place. The application of the projects are monitored and inspected.

EIA Positive
It is the decision of the Ministry stating that the adverse impacts of the project on environment, which is accepted to be on the desirable level according to scientific basis and due to the precautions taken; taking into consideration of the Commission for Scope Determination and Evaluation Assessment about Environmental Impact Assessment Report

EIA Negative
The decision of the Ministry stating that it is inconvenient to implement the project due to its negative impacts on the environment; considering the decisions of the Commission for Scope Determination and Evaluation/ Assessment.

AGRICULTURE

Agricultural Land Per Capita
This indicates the ratio of the total arable land to total population.

Consumption of Chemical Fertilizer
It refers to the amount of active ingredients (tonnes / year) Nitrogen, Phosphorus, or nitrogen - phosphorus – calcium mix in the amount of the fertilizer consumed in agriculture.

It refers to the total annual use of pesticides.

Organic Agriculture
Organic agriculture is agricultural production type in which no chemical inputs are used in production, only with the usage of the entries permitted by the By-Law and controlled and certified in every stage from production to consumption. This indicator represents the amount of agricultural products produced by organic agricultural methods and their fields.

Good Agricultural Practices
According to the By-Law published on the Official Gazette dated 7 December 2010 and with the issue number of 27778 ; good agricultural practices represent the processes to be applied to emphasize socially viable, economically profitable and efficient agricultural production which protects human health and environment and animal health and welfare.

FISHERY

Aquaculture Production

This indicates the amount of sea fish, shellfish, molluscs and fresh water products whether fished or cultivated from inland waters each year. The data related to production is the live weight of the product when it is caught.

Fishing Fleet Capacity

This indicates the total engine power of the fishing fleet.

TOURISM

Number of Tourists

It indicates the number obtained by subtracting the number of the daily tourists from the number of foreign visitor coming to Turkey and the visits of the citizens residing abroad.

Blue Flag Implementations

Blue flag is an international environment award which is awarded to the qualified beaches and marinas that have the required standards and it is the total number of blue flags given to the beaches and marinas in Turkey since 1997.

DISASTERS

Forest Fires

It indicates the total number of burned forest area within the whole forest areas in years.

Disasters by Types

It indicates the number of periodical occurrence of natural disasters such as hydraulic (flood, landslide), meteorological (storm, avalanche), geophysical (earthquake, volcanic activity) and climatic (heating, malformation, drought, fire) and industrial accidents, traffic accidents, pipeline transportation, and the deaths and property loss caused by these disasters.

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REPUBLIC OF TURKEY
MINISTRY OF ENVIRONMENT
AND URBANISATION

REPUBLIC OF TURKEY MINISTRY OF ENVIRONMENT AND URBANISATION
GENERAL DIRECTORATE OF ENVIRONMENTAL IMPACT ASSESSMENT
PERMIT AND INSPECTION
Environmental Inventory and Information Management Department