

**COUNTRY PROFILE
ON
ENVIRONMENT**

TURKEY

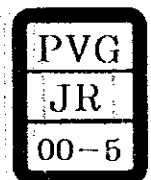
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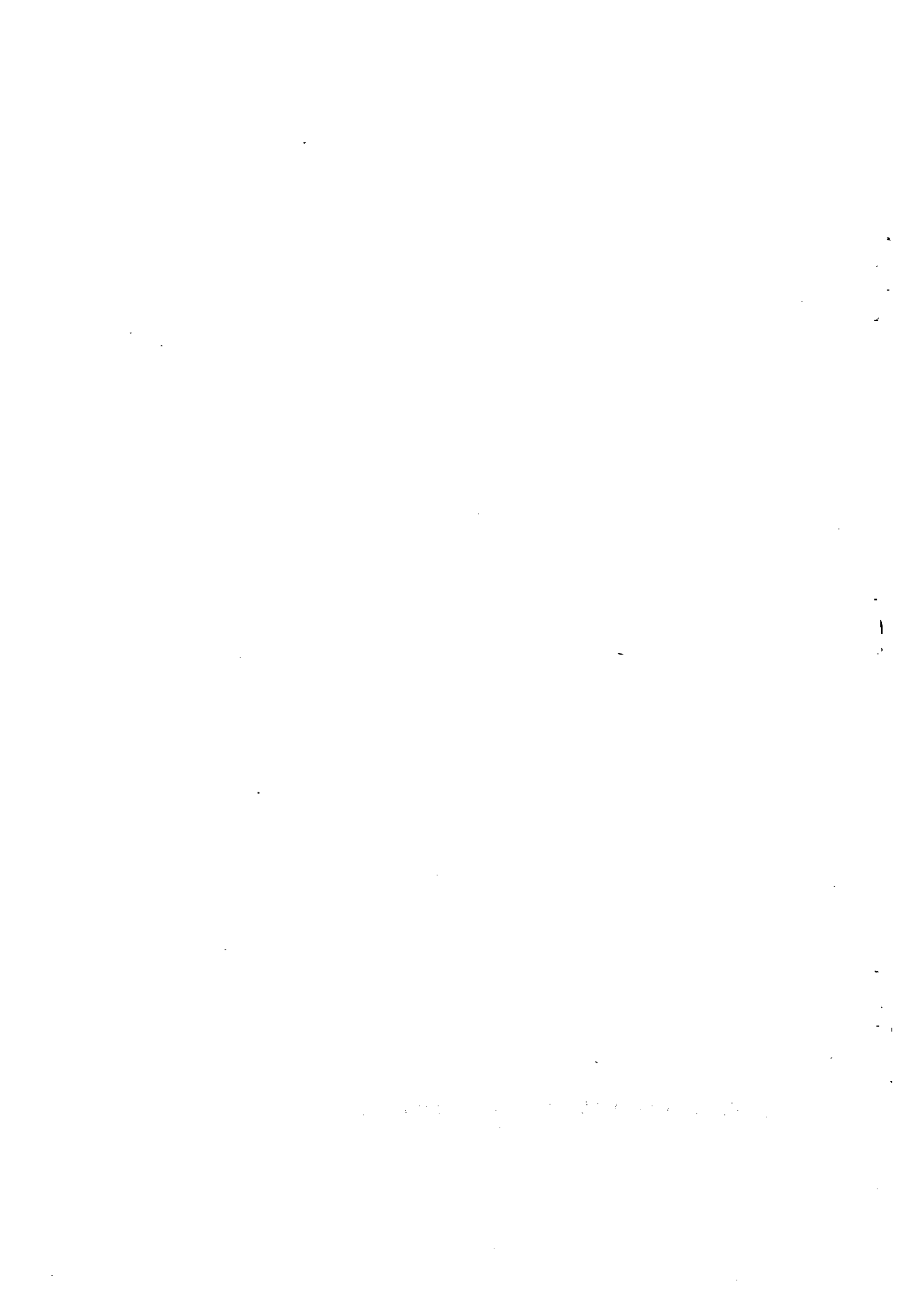


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USERS GUIDE: Contents of the Report

This report consisted of the following Chapters on environmental information of the country.

1. Keywords of the Environment

Various features and principal environmental issues and their related matters of the country are schematized within 1 page to easily understand the country's natural and social environmental issues on the whole.

2. Fact Sheet

Principal indices and natural and social environmental characteristics of the country such as economy, demographic statistics, socio-economic conditions, various important resources available in the country are described.

3. Institutional Context

3.1 Environmental Agency

Matrix table on governmental agencies related to the environmental issues in the Chapter 4 is described to grasp the role of the agencies easily. Responsibilities and organizational structure of the principal responsible agency for the environment, and responsibilities of related agencies are explained. Main activities of the various environmental non-governmental organizations are described in the table.

3.2 National Environmental Policy

Environmental policy of the country such as national environmental action plan is explained.

3.3 Environmental Laws and Regulations

Environmental laws and regulations of the country including their status of applications are described.

4. State of the Environment

In this Chapter, status of the various environmental issues as follows are covered with information on related agencies, related standards, laws and regulations, examples of the issue are explained. In the section 4.3, other kind of considerable environmental issues in the country are described based on the report which local consultant prepared.

4.1 Air Pollution	4.7 Waste Water Management
4.2 Water Pollution	4.8 Forest Conservation/Desertification
4.3 Other Pollution	4.9 Biodiversity
4.4 Waste Management	4.10 Natural Resource Management
4.5 Energy Conservation and Alternative Energy	4.11 Natural Disaster
4.6 Water Supply	4.12 Environmental Education

5. International Relationship

Status of the implementation of the economic and technical assistance projects in the country are outlined. International conventions and agreements on environment which the country agreed and ratified are listed up in section 5.1, and environmental projects which are funded and/or implemented in the country by donor countries and international organization in the section 5.2. In addition, location map of the project funded and implemented by using the Official Development Assistance (ODA) of Japanese government are showed.

6. Sources of Information

Governmental environmental agencies related institutions and NGOs are listed with the some information such as contact address and e-mail address.

7. References

References used in the report are listed.

1. KEYWORDS OF THE ENVIRONMENT

1.1 Features of the Country

	Related pages
<p>① Gross Domestic Production(GDP) US\$2,922 per capita (Japan : US\$33,857, China : US\$361) Total : US\$174 billion</p>	<ul style="list-style-type: none"> · 2. Fact Sheet p.3
<p>② High-concentrated Urban Population Urban population rate: 65 % Total population: 63 million, Urban population: 41 million</p>	<ul style="list-style-type: none"> · 2. Fact Sheet p.3 · 4.1, 4.2, 4.4
<p>③ Important coastal zones with long coast Coastal line: 8,272 km along the Black Sea, Marmara Sea, Aegean and Mediterranean Sea</p>	<ul style="list-style-type: none"> · 2. Fact Sheet p.3

1.2 Keyword of Environmental Issues

	Related page
<p>① Rapid urbanization</p> <ul style="list-style-type: none"> · Air pollution · Domestic waste water · Solid waste disposal 	<ul style="list-style-type: none"> 4.1 Air pollution p. 9 4.2 Water pollution p. 14 4.4 Waste management p. 19
<p>② Industrial issues (Industrial centers: Istanbul, Izmir, Izmit, Adana, Mersin, Iskenderun)</p> <ul style="list-style-type: none"> · Chrome and mercury from mining 	<ul style="list-style-type: none"> 4.2 Water pollution p. 14 4.4 Waste management p. 19
<p>③ Marine & coastal resources</p> <ul style="list-style-type: none"> · Oil leakage incident 	<ul style="list-style-type: none"> 4.2 Water pollution p. 14 4.4 Waste management p. 19
<p>④ Cultural & natural heritage</p> <ul style="list-style-type: none"> · Many conservation areas 	<ul style="list-style-type: none"> 4.9 Biodiversity p. 29

2. FACT SHEET

2.1 Socio-economic Index

Index	Data	Data year	Reference
Population	56.10 million (annual average incremental rate : 2.0% (1990~95))	1995	b)
Race	Turkish: 80%, Kurd: 17%, Arabian, Greece, Armenian, etc.	no information	f)
Religion	Islam 99%, Christianity, Judaism	no information	f)
Literacy rate	Adult female : 69% Adult male : 90%	1990	b)
Urban Population rate	69% (16.65million)	1995	b)
Life expectancy	67 (1990~1995 average)	1990-95	b)
Under-5 mortality rate	84 (per 1,000)	1993	b)
GNP ^{*1}	\$177 billion (\$2,970/person)	1993	b)
GDP ^{*1}	\$174 billion (\$2,922/person)	1993	b)
GDP structure	Agriculture : 15% Industry : 30% Service industry & others : 55%	1993	b)
Prime industry	Steel, machinery, hardware, automobile, textiles, leather, sugar, food processing	1996	f)
Prime resource	Chrome, iron, mercury, borate, copper, coal, wool, silk, cotton, tobacco, wheat, barley, corn, fruit, potato, sugar beet	1996	f)
Safe water (% of population with access) ^{*2}	Urban : 100% Rural : 70%	1980-1995	b)
% of sewerage population ^{*3}	Urban : 95% Rural : 90%	1980-1995	b)
Human Development Index (HDI)	0.772 (World rank 74, GDP per capita rank 70 in same year)	1994	e)

*1 : The estimated value of the GNP was exchanged and adjusted from local currency into US\$ by means of 3-year average of exchange rates. The estimated value of the GDP was presented in US\$ of 1993 based on the exchange rate.

*2 : "Safe water" includes treated surface water, and untreated water which is pumped up from protected spring / excavated well and sanitary well.

*3 : "Sewered population" should be met conditions that the population in urban area can use public sewerage and indoor facility such as dug hole outdoor toilet, pouring water toilet, private sewerage system, public community toilet, and similar facilities, and that the population in rural area can use dug hole outdoor toilet, pouring water toilet, or other proper treatment methods.

2.2 Geographical Characteristics

Area : 777,971 km ² (twice as Japan's), coastal line: 8,272 km
Geographical regions : 1) Black Sea region, 2) Marmara Region, 3) Aegean Region, 4) Central Anatolia Region, 5) Mediterranean Region, 6) East Anatolia Region, 7) Southeast Anatolia Region
Highest place : Mt. Ararat (5,123 m)

Source: a)

2.3 Meteorological Characteristics

Climate : continental climate (cold winter and hot summer), In the coastal parts of Marmara and Black Sea, sub-tropical climate (wet winter and mid-humid summer)
Season: (no information)
Average temperature: (no information)
Average annual rainfall: (650mm/year)
Climatic classification: (no information)

Source: a)

2.4 Ecological Characteristics

Ecological zones: 7 zones
Identified animals and plants : (no information)
Protected area : (see Section 4.9)

Source: a)

2.5 Hydrological Characteristics

Main river: Kizilirmak, Sakarya, Meric-Ergene, Nilüfer, Susurluk, Gediz-Nif
Lakes: Ban Golu, Tuz Golu, Sapanca, Manyas, Apolyont, Eber, Köycegiz, Gölçük

Source: a)

2.6 Land Use (1)

Land Classification	Area (million ha)
- Agricultural Land	28
- Forests, Heaths, Bushes	23
- Meadows - Pastures	22
- Others	4
- Area of Surface Waters	1
Total Area of Turkey	78

Source: a)

Land Use (2)

Land Classification	% of total area
Arable and permanent cropland	36.0 %
Pasture	28.0 %
Forest and heath	30.0 %
Marshes, river beds, bare rock	4.0 %
Inland waters	1.3 %
Settlements	0.7 %
Total	100 %

Source: a)

3. INSTITUTIONAL CONTEXT

3.1 Environmental Agency

3.1.1 Governmental Agency

(see "6. SOURCES OF INFORMATION" on each agencies and its contact address.)

Governmental Agency	4.1	4.2	4.3		4.4	4.5	4.6	4.7	4.8	4.9	4.10	4.11	4.12
	Air pollution	Water pollution	(1) Soil	(2) Noise	Waste	Energy	Water Supply	Waste Water	Forest	Biodiversity	Resources	Disaster	Education
Ministry of Environment	○	○	—	na	○	—	—	○	○	○	○	—	—
General Directorate of Meteorology	○	—	—	na	—	—	—	—	—	—	—	—	—
State Institute of Statistics	○	—	—	na	—	—	—	—	—	—	—	—	—
State Hydraulic Works	—	○	—	na	—	—	○	—	—	—	○	—	—
Research Institutes of General Directorate of Rural Affairs	—	—	○	na	—	○	—	—	—	—	—	—	—
Ministry of Energy	—	—	—	na	—	○	—	—	—	—	—	—	—
TEDAS	—	—	—	na	—	○	—	—	—	—	—	—	—
Bank of Provinces	—	—	—	na	—	—	○	—	—	—	—	—	—
Ministry of Forests	—	—	—	na	—	—	—	○	○	○	—	—	—
Society for Protection of Nature	—	—	—	na	—	—	—	—	○	—	—	—	—
General Directorate of Natural Disasters	—	—	—	na	—	—	—	—	—	—	—	○	—
Ministry of Education	—	—	—	na	—	—	—	—	—	—	—	—	○
Municipalities	—	—	—	na	○	—	—	—	—	—	—	—	—
Others	—	—	—	na	—	—	—	—	—	—	—	—	—

Note: 1) : ○ → related — → no relation na → no information

2) : 4.3(1) Soil pollution, 4.3(2) Noise, 4.4 Waste management,
 4.5 Energy conservation and alternative energy, 4.7 Waste water management,
 4.8 Forest conservation / desertification, 4.10 Natural resource management,
 4.11 Natural disasters, 4.12 Environmental education

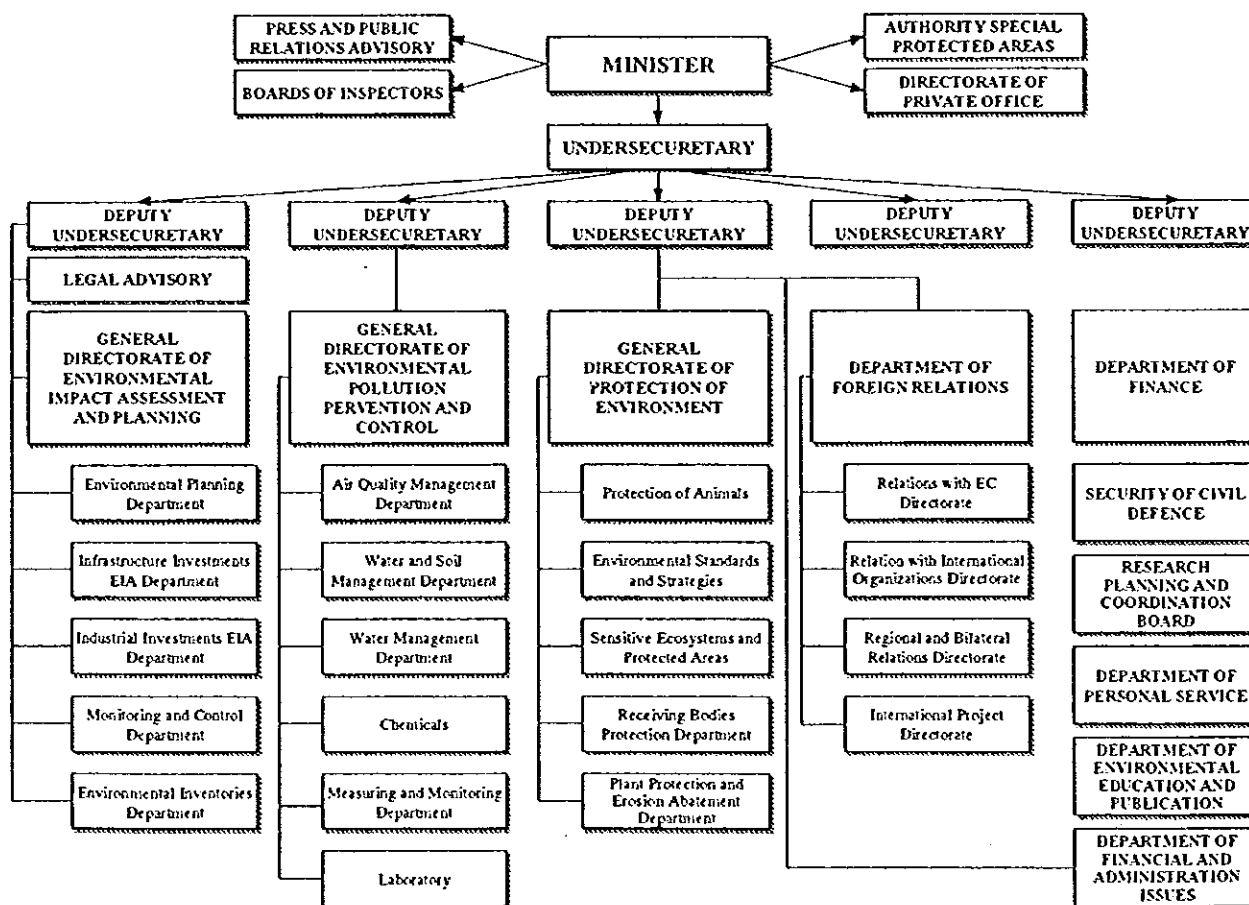
3) : Refer to each section related to other agencies when column "others" is filled by ○.

(1) Ministry of Environment

Specific duties of the Ministry of Environment

- to prepare programmes, to conduct research and projects, to determine principles on environmental protection
- to determine principles of protection and use of areas appropriate for urban and rural land-use
- to conduct, to approve and ensure the implementation of environmental plans, considering the development and regional plans that integrate economical and ecological values for decision making
- to determine appropriate environmental standards in co-operation with the Turkish Standard Institute
- to establish laboratories for analyses, experiments, measurements and controls
- to ensure the application of the environmental impact assessment procedure (giving positive or negative certificates) for each plan and project that may adversely affect the environment, to monitor and control these studies
- to observe and control country-wide each activity that has negative impacts on the environment
- to allow for co-operation and co-ordination between private and public institutions that are responsible for environmental issues, to encourage non-governmental organizations to make activities on these issues, to determine co-operation principles between ministries,
- to carry out training programs particularly for local authorities for efficient application of environmental programs, to monitor, encourage and guide these types of training activities, to improve public awareness, to conduct public opinions research studies about environmental issues

Source: a)



Source: a)

Organizational Structure of Ministry of Environment

(2) Other governmental organization related to environmental issues

Organization / Outline of activities	Annual budget	Number of staff
Authority for the Protection of Special Areas <ul style="list-style-type: none"> • definition of principles for conservation and protection of Special Protected Areas • definition of use and conservation criteria for urban planning • design of development plans in Special Protected Areas • establishment of maps concerning the areas • review of existing plans at all levels • compliance between plans and the protection principles 	(no information)	(no information)
Ministry of Forestry <ul style="list-style-type: none"> • management, development and conservation of forests (except private forests) • preparation of plans and programs for forest areas • control all kinds of constructions and settlements in forest areas • enforcement of related legislation • prevention forest fires 	(no information)	(no information)
State Planning Organization (SPO) <ul style="list-style-type: none"> • placed under the authority of the Prime Minister • main body responsible for the preparation of the «Five-Year Development Plans» and annual implementation programs in all sectors of activity, as well as of macro environmental policy within each plan • allocate investments to specific environmental projects such as water drinking supply or clean technologies for the purpose of pollution control • enforce the integration of environmental considerations into investment projects, partly of fully financed out of public funds 	(no information)	(no information)
Ministry of Public Works and Settlement <ul style="list-style-type: none"> • in charge of land development and land use planning at national level • responsible for permitting decisions on infrastructure projects like roads and highways, or other public facilities a) General Directorate of State Hydraulic Works (SHW) <ul style="list-style-type: none"> • responsible for the prevention of damage to both surface water and ground water and for the quality of these waters depending on their uses. To this extent, it bears primary responsibility for the sustainable development of water resources • main duties consist in planning, design and construction of hydraulic works for flood control, irrigation, drainage, drinking water supply and waste water disposal. In cities with more than 100.000 inhabitants, it is responsible for the long term supply of drinking, domestic and industrial water • As a monitoring authority, the SHW controls water quality in 679 sampling stations spread all over the country. Decentralized services of the SHW at regional level (which does not correspond to river basins scale) ensure the implementation and enforcement of the Turkish legislation on water b) Bank of Provinces <ul style="list-style-type: none"> • strong influence on the development of water protection policy through its planning and financing activities • responsible for planning sewerage systems and waste water treatment plants in cities with more than 100,000 inhabitants and provides for financing, credit as well as technical assistance for developing infrastructural projects related to sanitation services and drinking water supply to the municipalities with less than 100,000 inhabitants • municipalities are shareholders of the capital of the Bank of Provinces 	(no information)	(no information)
Ministry of Health <ul style="list-style-type: none"> • to set up water quality standards, notably for the abstraction of water for human consumption but also for bathing water 	(no information)	(no information)
Ministry of Agriculture and Rural Affairs a) General Directorate of Rural Services <ul style="list-style-type: none"> • responsible for agricultural land management and for land use and water resources development (sewerage and sanitation systems, irrigation, etc.) in rural areas (small cities with less than 3,000 inhabitants) 	(no information)	(no information)
Ministry of Culture <ul style="list-style-type: none"> • responsible to protect archaeological sites and sites of historical value which belong the national patrimony. The zones concerned are also considered as protected areas. Some of them are located in natural and/or coastal zones • draw up protection plans to be combined with other planification documents providing with environmental protection 	(no information)	(no information)

Organization / Outline of activities	Annual budget	Number of staff
Ministry of Tourism <ul style="list-style-type: none"> plays a coordinative role with respect to developments and investments in areas with tourism potential provides financing for municipal infrastructural investments projects in such areas, either through its own budget or as an intermediary with foreign and other lending institutions main responsibilities relating to environmental issues are to determine the boundaries of tourism regions and prepare land use plans strengthened by a specific legislation encouraging the development of tourism activities, it has a strong position to decide on projects that may adversely affect the environment. 	(no information)	(no information)
Local Governance System <ul style="list-style-type: none"> According to the Turkish Constitution, local administrative entities are of three different types: provincial, municipal and village administrations. Each possesses its own legal personality and financial resources At the provincial level, representing the central government, the executive power is exercised by the Governor who heads the Special Province Administrations. There are currently 80 provinces in Turkey Municipalities are responsible for the towns with more than 2,000 inhabitants within the provinces while villages are another level of local administration for sites with less than 2,000 inhabitants 	(no information)	(no information)

Source: a)

3.1.2 Non-governmental Agency (NGO)

Name of NGO	Established year	Main activities
Society for the Protection of Nature	(no information)	(no information)
Society for the Conservation of Nature in Turkey	(no information)	(no information)
Environmental Problems foundation of Turkey	(no information)	(no information)
Society for the Prevention of Air Pollution	(no information)	(no information)
Cancerology and Ecology Association	(no information)	(no information)
Solar Energy Research Foundation	(no information)	(no information)
Foundation for the conservation of Environment-Monument-Touristic Assets of Turkey	(no information)	(no information)
Aegean Environmental Health Center Association	(no information)	(no information)
Soil Science Association	(no information)	(no information)
Society for the Preservation of Plants of Turkey	(no information)	(no information)

Source: a)

3.2 National Environmental Policy

Policy/Project Name and Contents	Funding or Implementing Agency
(1) Seventh Five-Year Development Plan (1996-2000) <ul style="list-style-type: none"> Under the plan, a National Strategy of the Environment (NEAP) is being drafted with assistance of the World Bank. 	World Bank
(2) National Biodiversity Strategy and Action Plan <ul style="list-style-type: none"> Providing strategies with targets to be implemented through a priority action plan. A Biodiversity steering Committee were formed by the Government. 	World Bank
(3) National Waste Management Strategy <ul style="list-style-type: none"> Being experimented since 1995 on the basis of a Study on Appropriate Solid Waste Management Practices in Turkey funded by the World Bank Part I: developed a Draft National solid Waste Management Strategy funded by METAP Part II: implementing the Strategy through pilot actions and projects funded by the Global Environmental Facility (GEF) 	(no information)
(4) National Agenda 21 <ul style="list-style-type: none"> Under preparation in response to the recommendations of UNCED, 1992 Coordinated by the Ministry of environment and conducted by a Task Force formulated relevant governmental agencies and NGOs Aims to address all sectoral and cross-sectoral issues at the interface between environment and development Focusing on the strengthening of local authorities capability to address effectively environmental issues at their level To supplement the NEAP 	(no information)
(5) Local Agenda 21 <ul style="list-style-type: none"> Coordinated by International Union of Local Authorities – Eastern Mediterranean Middle East Section (IULA-EMME) 	(no information)

Source: a)

3.3 Environmental Laws & Regulations

Laws & Regulations	Status	Related Sections
<p>Constitution</p> <ul style="list-style-type: none"> • Constitution, Articles 43, 44, 46, 63, 125 - Meadow and pasture areas, suitable for farming, forests, shall be included within the content of articles related to public benefit with more explicit definitions. - The article on land ownership shall be handled with an approach of arranging land utilization. - The protection of natural, cultural and historical values shall not be only the duty of the state. - Arrangements shall be made, giving priority to bases concerned with the environment among administrative cases. - Nationalization is aimed without making a distinction between public acquisition and nationalization. Public acquisition shall be perceived as a means of purpose of utilization and extended so as to protect environment, especially the natural eco system. 	(no information)	
<p>Tourism</p> <ul style="list-style-type: none"> • Law No. 2634 on Encouraging Tourism - Tourism investments have been realized without considering the protection of natural environment and received state support. In order to remedy this fact, the Law on Encouraging Tourism shall be revised. 	(no information)	4.9
<p>Environment</p> <ul style="list-style-type: none"> • Law No. 2872 on Environment - The Law shall be rearranged according to prevailing conditions in line with sustainable development principle. The distribution of authority and responsibility among institutions shall be clarified. 	(no information)	
<p>Forest</p> <ul style="list-style-type: none"> • Forest Law No. 6831 - Actions shall be taken towards protecting and developing natural resources. 	(no information)	4.8
<p>Reconstruction Law</p> <ul style="list-style-type: none"> • Reconstruction Law, No. 3194 - Arrangements shall be made to secure adaptation to the current conditions and integration with the planing process of the natural environment. 	(no information)	
<p>Coastal Area</p> <ul style="list-style-type: none"> • Law No. 3621 on Coasts, Article 4/b, c • Law No. 15 shall be rearranged entirely - The present construction that is based on a hundred meter coastal line should be rearranged through taking account of topographical conditions and natural resources. The related penalties and pecuniary fines should be updated. 	(no information)	
<p>Culture</p> <ul style="list-style-type: none"> • Law No. 2863 on Protecting Cultural and Natural Values, Article 3/2 - The Law has placed importance n the protection of cultural values rather than the natural which is also to be taken into consideration. 	(no information)	

Source: a-12)

4. STATE OF THE ENVIRONMENT

4.1 Atmospheric Pollution

In Turkey, poor-quality fuel use, industrial facilities, motor-driven vehicles and atmospheric conditions causes air pollution. Though Turkey has a big wealth of lignite, using lignite reserves without any improvement in industries and houses is one of the main reasons of pollution. The affects of atmospheric pollution are mostly seen in Erzurum, Sivas, Kayseri, Denizli, Eskisehir, Diyarbakır, Bursa and Ankara. Incorrect site selection, discharging wastes, gas and dust through the atmosphere, using insufficient technologies constitutes the main reasons of air pollution causing from industries. At present, air pollution causing from industries reaches important levels in Istanbul, Izmit, Bursa, Adapazarı, Samsun, Murgul, Izmir, Ereğli(Black Sea Region), Karabük, Bartın, Kırıkkale and in the region of Adana Tarsus Mersin.

By the implementation of the natural gas project (started in 1987) in Istanbul, Ankara, Eskisehir, Bursa and Izmir in industrial and housing usage, approximately 20% of total population of Turkey is expected to have pure fuel. Revision of the vehicles through the emission standards, which is used in 21 European Countries, for reducing the pollution causing from motor vehicles is still continuing. From 1995, graded application of unleaded petrol and catalyst has been carried out.

Atmospheric pollution measure and monitoring activities which have started in 1961 by the Ministry of Health, was carried on with half-automatic equipment until 1987 in Ankara. At present, air pollution level is measured in 71 centre in country-wide with 155 measure equipment as SO₂ and particular material. In addition to this, measuring of NO_x parameter has started in 1994 in Ankara.

Source: a)

Related Agency
Meteorological characteristics ① General Directorate of Meteorology
Atmospheric Pollution ② State Institute of Statistics ③ Ministry of Environment

Source: a)

Major Constraints Sited by National Environmental Action Plan (NEAP)
<ul style="list-style-type: none"> • Limited information on air quality, unreliable and limited monitoring • Inefficient use of energy • Poor enforcement on use of low quality coal • Use of low quality lignite • Use of outdated and polluting technologies in industries • Lead emmissions form motor vehicles is persistent, low supply and low economic incentives on the use of unleaded gasoline • Inadequate enforcement on power plants • Heavy reliance on polluting fuels

Source: a)

Standards for Parameters Cited in the Water Pollution Control Regulation

Parameter	Standard	Parameter	Standard
Solinity	Standard Methods 1985 Sec. 200-210 p.101	NH4-N	TS-5784/April 1983 TS-5868/April 1988
COD	TS-2789/April 1977	NO3	TS-6231/Dec. 1988 TS-6232/Dec. 1988 TS-3308/Feb. 1979
BOD5	TS-4957/Nov. 1986	NO2	Standard Methods 1985 Sec.400-419-429 p.404-429
Dissolved Oxygen	TS-5677/April 1988 TS-4950/Nov. 1986	Temperature	Standard Methods 1985 Sec.200-212 p.126
CO2, HCO3, CO3	TS-4182/March 1984	Conductivity	Standard Methods 1985 Sec.200-205 p.76
Acidity	TS-3790/Sept. 1982	Color	Standard Methods 1985 Sec.200-204 p.67
Alkalinity	TS-3790/Sept. 1982	Odor	Standard Methods 1985 Sec.207 p.85
Taste	Standard Methods 1985 Sec.211-211A-211B p.122	Silver	Standard Methods 1985 Sec.324-324A-324B p.242
Turbidity	TS-091/March 1987	Beryllium	Standard Methods 1985 Sec.309-309A-309B p.191
PH	TS-3263/Sep. 1978	Selenium	TS-4235/April 1984
Total Suspended Solids	TS-7093/May 1989	Barium	TS-4330/June 1985
Settleable Solids	TS-4111/Feb. 1984	Lithium	TS-4330/June 1985
Volatile & Fixed Solids	Standard Methods 1985 Sec.209-209A-209B-209C-209D p.97	Calcium	TS-4473/April 1985 TS-4290/Jan. 1989 TS-6228/Dec. 1977 TS-2879/Nov. 1977
Sulfur	Standard Methods 1985 Sec.427-427C-427D p.470	Chromium	TS-4629/Dec. 1985 TS-3654/Sep. 1981
Sulfate	TS-5095/march 1987	Lead	TS-6290/Jan. 1989 TS-4112/Feb. 1984
Sulfite	Standard Methods 1985 Sec.428-428A-428B p.479	Copper	TS-6290/Jan. 1989 TS-3655/Sep. 1981
Chloride	TS-4164/Feb. 1984		Standard Methods 1985 Sec.303-304 p.151
Phosphorus	TS-4082/Dec. 1983	Ferrium	TS-3651/Sep. 1981
Phenol	Standard Methods 1985 Sec.309-309A-309B p.191	Manganese	TS-3708/Feb. 1982 TS-6299/Jan. 1989
Cyanide	Standard Methods 1985 Sec.412-412C-412D-412E p.327	Mercury	TS-2537/Dec. 1987
Oil & Grease	Standard Methods 1985 Sec.503-503A-503B-503C p.496	Productivity	Standard Methods 1985 Sec.10012 p.1075
Surface Active Substances	TS-518/April 1978	Toxicity	TS-5676/April 1988
Hydrocarbons	Standard Methods 1985 Sec.5038 p.501	Radioactivity	Standard Methods 1985 Sec.701C p.627
Bromine	TS-3309/Feb. 1979	Chlorophyll-A	Standard Methods 1985 Sec.1002C p.1067-1072
Fluorine	TS-4234/April 1984	Sodium	TS-4530/June 1985
Iodine	TS-3309/Feb. 1979	Potassium	TS-4530/June 1985
Chlorine	TS-5489/Feb. 1988 TS-6229/Dec. 1988 TS-6230/Dec. 1988	Antimony	TS-4205/March 1984
Total Organic Carbon	Standard Methods 1985 Sec.505-505A-505B-505C p.507	Strontium	TS-4471/April 1985
Pesticides	Standard Methods 1985 Sec.509 p.538	Vanadium	TS-4387/Feb. 1985
Organic Acids	Standard Methods 1985 Sec.504-504A-504B p.503	Hardness	TS-4477/April 1985
Nickel	TS-3837/Dec. 1982 TS-6290/Jan. 1989	Arsenic	TS-3581/March 1981
Zinc	TS-6290/Jan. 1989 TS-3752/Sep. 1981	Borate	TS-3661/March 1981
Al	TS-3662/Sep. 1981	Magnesium	TS-6228/Dec. 1988 TS-2879/Dec. 1977
Molybdenum	TS-4268/Nov. 1989	Coliform Groups	Standard Methods 1985 Sec.9003-9008-9009 p.827
Cobalt	TS-6290/Jan. 1989 TS-4472/April 1985		

Source: g)

Winter season sulphurdioxide concentrations of selected provincial centers and the changes from the same period of the previous year ⁽¹⁾				
	1992-1993		1993-1994	
	Winter season		Winter season	
	Average $\mu\text{g}/\text{m}^3$	Rate of Change (%)	Average $\mu\text{g}/\text{m}^3$	Rate of Change (%)
Ankara	130	-31	90	-31
Antalya	100	113	43	-57
Bursa	172	-40	150	-13
Diyarbakir	276	-15	169	-39
Erzurum	379	23	404	6
Istanbul	290	-23	253	-13
Izmir	219	30	139	-36
Konya	210	15	252	20
Samsun	106	26	90	-15
Sivas	337	20	328	-3

⁽¹⁾ Limit value of winter season average for SO₂ is 250
Source: The Ministry of Health

Winter season particulate matter concentrations of selected provincial centers and the changes from the same period of the previous year ⁽¹⁾				
	1992-1993		1993-1994	
	Winter season		Winter season	
	Average $\mu\text{g}/\text{m}^3$	Rate of Change (%)	Average $\mu\text{g}/\text{m}^3$	Rate of Change (%)
Ankara	97	-18	108	12
Antalya	133	43	116	-13
Bursa	99	-20	97	-2
Diyarbakir	276	-1	176	-36
Erzurum	225	25	260	16
Istanbul	114	-19	100	-12
Izmir	165	3	115	-30
Konya	82	-9	98	19
Samsun	50	61	35	-30
Sivas	208	-10	211	1

⁽¹⁾ Limit value of winter season average for SO₂ is 250
Source: The Ministry of Health

Average Concentration of Air Pollutants During the Winter Season in $\mu\text{g}/\text{m}^3$								
	Winter Season	Oct	Nov	Dec	Jan	Feb	Mar	Average
Particulates	1985-86	71	127	211	143	150	166	146
	1990-91	88	138	112	128	92	72	105
SO ₂	1985-86	74	170	285	295	303	274	233
	1990-91	97	243	256	290	238	146	211

Source: Environmental Policies in Turkey, 1992 (OECD)

Cities	Sulphur Dioxide		Particulate matter	
	Average concentration (a) ($\mu\text{g}/\text{m}^3$)	Number of days exceeding the short-term limit value (b)	Average concentration (c) ($\mu\text{g}/\text{m}^3$)	Number of days exceeding the short-term limit value (d)
	1989/90	1989/90	1989/90	1989/90
Diyarbakir	491	89	289	91
Malatya	385	69	164	22
Bursa	385	64	154	22
Istanbul	356	131	161	53
Konya	309	42	106	11
Kütahya	299	48	113	3
Eskisehir	297	33	70	1
Sivas	296	66	149	5
Izmit	295	51	121	8
Ankara	268	-	152	-
Iskenderun	259	-	157	8
Samsun	246	21	60	-
Erzurum	244	45	131	37
Elazig	243	24	223	53
Canakkale	230	35	44	-
Yozgat	229	23	71	-
Usak	199	-	105	-
K. Maras	196	44	63	-
Kayseri	190	28	124	14
Gaziantep	177	-	126	-
Tekirdag	163	6	96	-
Kastamonu	157	11	76	1
Izmir	115	-	116	3
Kars	105	-	73	-
Zonguldak	101	-	147	24
Erzincan	170	10	166	26

a) Average sulphur dioxide, winter season: 250 $\mu\text{g}/\text{m}^3$ (Turkey), 125 $\mu\text{g}/\text{m}^3$ (WHO)

b) Sulphur dioxide short term: 400 $\mu\text{g}/\text{m}^3$ (Turkey), 350 $\mu\text{g}/\text{m}^3$ (WHO)

c) Average particulate matter, winter season: 200 $\mu\text{g}/\text{m}^3$ (Turkey), 120 $\mu\text{g}/\text{m}^3$ (WHO)

d) Particulate matter short term: 300 $\mu\text{g}/\text{m}^3$ (Turkey), 350 $\mu\text{g}/\text{m}^3$ (WHO)

Source: Turkish State Institute of Statistics, Environmental Statistics - Air Pollution 1980-1990 (1992) (OECD)

Emission Standards for Industries

Group	Type	Emission Limits on
I Furnaces and boilers	Solid Fuel fired Furnaces and Boilers	Emissions of Dust, NO _x , Halogen Compounds, SO ₂
	Liquid Fuel fired Furnaces and Boilers	Emissions of Dust, CO, NO _x , SO ₂
	Gaseous Fuel fired Furnaces and Boilers	Emissions of Dust, CO, NO _x , SO ₂ and aldehyde
II Refuse and Waste Incinerators	Furnaces where Household and Similar Wastes in General are completely or partly destroyed by incineration	Emission of Dust, Cl, F, Co
	Polychlorobiphenyl Containing Wastes	Emissions of Dust, C, F, Co
	Other Waste incinerators	Emissions of Dust, Carbon, CO, Cl, F
	Garbage Treatment Plants	Emission of Dust
	Scrap metal Processing Plants	Emission of Dust
III Earth Materials Plants	Mines and Stone Quarries	Emission of Dust
	Plants for Balsting and Grinding Schist, Clay and Related Minerals	Emission of Dust
	Dolomite, Magnesite and Coal fired Facilities	Emission of Dust
	Gypsum Roasting Plants	Emission of Dust
	Cement plants	Emission of Dust
	Kilns where Bricks, Tiles and Other Industrial Ceramics are Fired	Emission of Dust, F
IV	Blast Furnaces	Emission of Dust
	Non-ferrous Metal Smelters	Emissions of Dust, SO ₂
V	Iron Sintering Plants	Emissions of Dust, SO ₂ , F
	Furnaces for Sintering Phosphate Concentrates	Emissions of Dust, F
VI	Cupola Furnaces	Emissions of Dust, Co
	Converters, Electric Arc and Vacuum Smelters for Processing Steel	Emissions of Dust, Co
	Electrical Ash Fusing Plants	Emissions of Dust, F
	Reverberatory Furnaces for Processing by Steel	Emission of Dust
	Aluminum Smelters	Emissions of Dust, Cl, F
	Non-ferrous (Metals other than Aluminum) Smelters	Emissions of Dust, Cl, F
VII	Foundries (Casting for iron, temper, steel, non ferrous etc.)	Emissions of Dust, SO ₂ , Organic Compounds
VIII Acid Producing plants	Hydrochloric Acid Plants	Emission of HCl
	Nitric Acid Plants	Emission of NO _x
	Sulfur Dioxide, sulfur Trioxide and Sulfuric Acid Plants	Emission of SO ₂ , Aerosol
IX	Aluminum Plants	Emissions of Dust, F
	Corundum (α-Alumina) Plants	Emission of Dust
X	Carbide Plants	Emissions of Dust, CO
	Chlorine Plants	Emissions of Cl, Hg
	Fluoride Plants	Emission of Fluorinated Hydrogen
	Hydrofluoric Acid Plants	Emission of Fluorinated Hydrogen
	Sulfur Plants (Claus Plants)	Emission of Hydrogen Sulfide, SO ₂
XI	Fiberboard and Related Wood Product Plants	Emission of Dust, Carbon
XII	Petroleum Refineries	Emission of Dust, H ₂ S, Hydrocarbons
XIII	Anthracite Gasification Plants	Emission of Dust, H ₂ S
XIV	Plants for Producing and Processing Bituminous paving Materials	Emission of Dust
XV	Graphite Plants	Emission of Dust, Carbon
XVI	Glass Factories	Emission of Dust, F
XVII	Fertilizer Complexes	Emissions of Dust, NO _x , SO ₂ , F, Ammonia
XVIII	Stables and Poultry Coops	Emission of Dust

Source: g)

Air Quality Limits

Parameter	Unit	Long term Standards	Short term Standards	
				Max. Hourly Ref. Stand.
SO ₂ , SO ₃	µg/m ³			
a. General		150	400	900
b. Industrial Zones		250	400	900
CO	µg/m ³	10,000	30,000	900
NO ₂	µg/m ³	100	300	-
NO	µg/m ³	200	600	-
Cl ₂	µg/m ³	100	300	-
HCl and Gaseous Inorganic Cl	µg/m ³	100	300	-
HF and Gaseous Inorganic F	µg/m ³	-	10	30
O ₃ Photochemical Oxidizers	µg/m ³	-	-	240
Hydrocarbons	µg/m ³	-	140	280
H ₂ S	µg/m ³	-	40	100
Suspended Particulate Matter (PM)				
a. General	µg/m ³	150	300	-
b. Industrial Zone	µg/m ³	200	400	-
Pb in PM and its Compounds	µg/m ³	2	-	-
Cd in PM and its Compounds	µg/m ³	0.04	-	-
Settling dust (Including particles > 10µm)				
a. General		350	650	-
b. Industrial Zones		450	800	-
Pb and its Compounds in Settling Dust	µg/m ² day	500	-	-
Cd and its Compounds in Settling Dust	µg/m ² day	7.5	-	-
Tl and its Compounds in Settling Dust	µg/m ² day	10	-	-

Source: g)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on air pollution	?	
② Ambient air quality standard	?	
③ Emission standard (stationary and/or mobile sources)	?	
④ Environmental monitoring results	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.2 Water Pollution

The principal factors causing water pollution in Turkey can be summarized as industrialization, urbanization, population growth, chemical fertilizer and pesticide usage in agriculture. Groundwater and surface water resources are started to become contaminated. Main sources of groundwater pollution in Turkey can be given as follows:

- Seepage of domestic waste water into the groundwater due to the inefficient sewerage systems in urban areas and septic tanks in rural areas
- Industrial pollution
- Contamination from pesticides and fertilizers in agriculture.
- Saline water intrusion

The impacts of water pollution can be seen in Sakarya River, Meriç-Ergene River, Nilüfer Stream, Susurluk Stream, Gediz-Nif Stream densely. This causes unhealthy and insufficient water supply, decreased biodiversity in freshwater, less fish productivity and eutrophication.

Lakes have an importance as a drinking water source and many lakes are under the risk of pollution. Lake Sapanca, Lake Manyas, Lake Apolyont, Lake Eber, Lake Köycegiz, Lake Tuz and Lake Gölçük are the most polluted lakes.

As a result of discharging the sewage of settlement areas in coastal zones directly into the sea, pollutant load reaches with rivers and petroleum leak into the seas, marines of Turkey is under the threat of degradation. The Mediterranean Sea with a surface area of 2.5 million km² is under the risk of pollution because of the coastal settlements and high maritime traffic. The annual discharge from the sewage canals and rivers is 36.3 billion m³. Although the industrial water volume is low, it contains high load of toxic substances. The pollution in the Aegean Sea reaches to important levels because of the discharges from 50 major points including rivers, tourism and vacation developments and industries along the coast and input from the Black Sea. The pollution load of the Black Sea increases because of natural causes and large rivers of several countries including Turkey. 766 million m³/year of waste water are discharged into the Marmara Sea. Eutrophication and disappearance of fish species are the major impacts of pollution of Marmara Sea.

Source: a)

Related Agency	
Water Pollution	
<ul style="list-style-type: none"> • State Hydraulic Works • Ministry of Environment 	

Source: a)

Winter season particulate matter concentrations of selected provincial centers and the changes from the same period of the previous year ⁽¹⁾						
	BOD		COD		SS	
	No. of Poll. load establish	(tons/year)	No. of Poll. load establish	(tons/year)	No. of Poll. load establish	(tons/year)
Turkey						
A	355	205,437	355	1,493,166	525	363,078
B	38	5,360	59	39,776	55	3,868
31						
A	161	149,663	120	76,014	160	48,693
B	21	4,683	35	37,097	30	2,660
32						
A	150	48,895	151	109,532	146	43,182
B	-	-	-	-	-	-
34						
A	22	6,500	22	7,710	22	7,147
B	1	0.5	1	0.8	1	0.5
35						
A	15	343	19	20,990	17	984
B	16	676.5	21	2,577.2	23	1,173.5
36						
A	6	36	13	1,259,976	150	251,761
B	-	-	-	-	-	-
37						
A	-	-	10	18,944	25	2,006
B	-	-	2	100	1	34

A refers to having no wastewater treatment plant

B refers to having wastewater treatment plant

Source: SIS

Quality Criteria for Sea Water

Parameter	Unit	Standards for Coastal and Sea Water Used for Recreational Purposes	General Quality Criteria for Sea Water
Color	-	Natural	-
Color and Turbidity	-	-	Natural
Taste and Odor	-	Natural	-
Transparency	Sec. Disc.	> 2m	-
PH	-	6-9	6-9
Oil and Grease	Mg/l	Should not differ a esthetically from the natural oil and grease content of sea water	-
Total Coliform	MPN/100 ml	1,000	-
Fecal Coliform	MPN/100 ml	200	-
Surface Active Substances	0.3mg/l launl sulfate	Should not form residual foam	-
Phenols	mg/l	<0.005	0.001
Dissolved Oxygen	mg/l	Not >80% saturation	Not <90% saturation
Tar Residues and floating material	-	None	-
Floating Material	-	-	-
Suspended Solids	mg/l	-	30
Crude Oil and Oil Derivatives	mg/l	-	0.003
Radioactivity	-	-	Should not exceed natural types and levels of the particular sea.
Productivity	-	-	Seasonal productivity levels should be preserved for the particular sea.
Toxicity	-	-	None
Copper, Cu	mg/l	-	0.01
Cadmium, Cd	mg/l	-	0.01
Chromium, Ch	mg/l	-	0.1
Lead, Pb	mg/l	-	0.1
Nickel, Ni	mg/l	-	0.1
Zinc, Zn	mg/l	-	0.1
Mercury, Hg	mg/l	-	0.004
Arsenic, As	mg/l	-	0.1
Ammonia, NH ₄	mg/l	-	0.02

Source: g)

Quality Criteria of Inland Water Resources by Class

Water Quality Parameter	Unit	Water Quality Class			
		I	II	III	IV
Temperature	°C	25	25	30	>30
PH	-	6.5-6.5	6.5-8.5	6.0-9.0	<6.9-9.0<
Dissolved Oxygen	mg O ₂ /l	8	4	3	<3
Oxygen Saturation	%	90	70	40	<40
Chlorine Ions	mg Cl/l	25	200	400	>400
Sulfate Ions	mg SO ₄ /l	200	300	400	>400
Nitrogen as Ammonia	mg NH ₄ -N/l	0.2	1	2	>2
Nitrogen as Nitrite	mg NO ₂ -N/l	0.002	0.01	0.05	>0.05
Nitrogen as Nitrate	mg NO ₃ -N/l	5	10	20	>20
Total Phosphorus	mg PO ₄ -N/l	0.02	0.16	0.65	>0.65
Total Dissolved Matter	mg/l	500	1500	5000	5000
Color	Pt-Co Units	5	50	300	>300
Sodium	mg Na/l	125	125	250	>250
COD	mg/l	25	50	70	>70
BOD	mg/l	4	8	20	>20
Organic Carbon	mg/l	5	8	12	>12
Total Kjeldahl Nitrogen	mg/l	0.5	1.5	5	>5
Emulsify Oil an Grease	mg/l	0.02	0.3	0.5	>0.5
Methylene Blue Active Substances	mg/l	0.05	0.2	1	>1.5
Phenolic Substances	mg/l	0.002	0.01	0.1	>0.1
Mineral Oils and Derivatives	mg/l	0.02	0.1	0.5	>0.5
Total Pesticides	mg/l	0.001	0.01	0.1	>0.1
Mercury	µgHg/l	0.1	0.5	2	>2

Water Quality Parameter	Unit	Water Quality Class			
		I	II	III	IV
Cadmium	µgICd/l	3	5	10	>10
Lead	µgPb/l	10	10	50	>50
Arsenic	µgAs/l	20	50	100	>100
Copper	µgCu/l	20	50	200	>200
Chromium (total)	µgCr/l	20	20	200	>200
Chromium	µgCr ⁺⁶ /l	indeterminable	20	50	>50
Cobalt Cr ⁺⁶	µgCo/l	10	20	200	>200
Nickel	µgNi/l	20	50	200	>200
Zinc	µgZn/l	200	500	2000	>2000
Cyanide	µgCN/l	10	50	100	>100
Fluorine	µgF/l	1000	500	2000	>2000
Free Chlorine	µgCl ₂ /l	10	10	50	50
Sulfur	µgS/l	2	2	10	>10
Iron	µgFe/l	300	1000	5000	>5000
Manganese	µgMn/l	100	500	3000	>3000
Boron	µgB/l	1000	1000	1000	>1000
Selenium	µgSe/l	10	10	20	>20
Barium	µgBa/l	1000	2000	2000	>2000
Aluminum	µgAl/l	0.3	0.3	1	>1
Radioactivity, α-Activity	pCi/l	1	10	10	>10
Radioactivity, β-Activity	pCi/l	10	100	100	>100
Fecal Coliform	MPN/100ml	10	200	2000	>2000
Total Coliform	MPN/100ml	100	2000	10000	>10000

Source: g)

Eutrophication Control Limit Values in Lakes, Ponds, Marshes and Dam Reservoirs

Parameter	Unit	Nature Conservation Areas and Recreation	Various Uses (including natural salt, bitter and soda-rich lakes)
PH	-	6.5-8.5	6-10.5
COD	mg/l	3	8
Dissolved Oxygen	mg/l	7.5	5
Suspended Solids	mg/l	5	15
Total Coliform	MPN/100ml	1000	1000
Total Nitrogen	mg/l	0.1	1
Total Phosphorus	mg/l	0.005	0.1

Source: g)

Inland Waters

	Water quality of rivers							
	(mgO ₂ /liter)				(mgO ₂ /liter)			
	Dissolved Oxygen (DO)				BOD			
	1980	1985	1990	1993	1980	1985	1990	1993
Porsuk	9.3	9.4	9.2	10.0	1.8	2.0	1.1	1.2
Sakarya	9.6	8.9	9.7	9.1	2.0	3.6	2.7	4.2
Yesilirmak	-	-	9.5	8.8	-	-	1.0	5.7
Gediz	9.2	8.6	3.8	5.5	2.4	2.3	10.6	12.5

Source: Central Directorate of State Hydraulic Works

	Water quality of rivers							
	(mgN/liter)				(mgP/liter)			
	Dissolved Oxygen (DO)				BOD			
	1980	1985	1990	1993	1980	1985	1990	1993
Porsuk	1.63	1.56	1.30	1.32	0.10	0.04	0.05	0.06
Sakarya	1.08	0.82	1.21	1.14	0.11	0.15	0.21	0.28
Yesilirmak	-	-	-	2.96	-	-	0.22	0.19
Gediz	1.49	0.98	1.87	0.98	0.71 ⁽¹⁾	0.42	0.61	0.37

⁽¹⁾ Data refer to 1981

Source: Central Directorate of State Hydraulic Works

Water quality of rivers

	Ammonium (mgN/liter)				Lead (mgP/liter)			
	1980	1985	1990	1993	1980	1985	1990	1993
Porsuk	0.70	0.27	0.17	0.10	-	0.048	-	0.012
Sakarya	0.46	0.35	0.33	0.34	-	-	0.023	0.013
Yesilirmak	-	-	0.18	0.45	-	-	-	-
Gediz	0.17	0.08	0.42	0.00	-	-	-	-
	Total Nitrogen (mgN/liter)				o-Phosphate (mgP/liter)			
	1980	1985	1990	1993	1980	1985	1990	1993
K. Bogazi	0.43	-	-	0.13	0.11	0.2	0.05	0.05
Sapanca	0.94	-	-	0.17	0.03	-	0.03	0.04
Gala	-	-	-	5.46	-	-	0.68	0.3
Altinapa	-	-	-	2.07	-	-	0.11	0.09

Source: Central Directorate of State Hydraulic Works

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on water pollution	?	
② Water quality standard	?	
③ Effluent standard	?	
④ Drinking water standard	?	
⑤ Water quality monitoring	?	
⑥ Guidelines on water quality	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.3 Other Pollution

(1) Soil Pollution

Turkey has 27.9 million hectares of land used for agriculture. Soil has a great importance as a natural resource. Main causes of soil pollution is given below:

- Excessive pesticide and fertiliser usage
- Destruction of forests with fires
- Excessive use of pastures
- Erosion
- Using of agricultural lands for industries

In Turkey, great amount of productive soil is lost every year and 73.4% of total land is exposed to erosion. Although the first law concerning the prevention of erosion is enacted in 1937 within the context of Forest Law, any relevant activity has been done until 1950. In 1953 DSI(State Hydraulic Works) and General Directorate of Forest started improvement activities. In the context of these studies, training courses for farmers including mechanical methods for erosion precaution were carried out. Today, improvement of water and soil resources are carried on under the responsibility of Research Institutes of General Directorate of Rural Affairs. Besides, with active support from NGOs, public awareness about erosion prevention has increased.

Source: a)

Related Agency	
① Research Institutes of General Directorate of Rural Affairs	

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on soil pollution	○	• Forest Law
② Regulation on soil pollution	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

(2) Noise

The main factors causing noise pollution are; rapid urbanisation and population growth, economical difficulties and insufficient training about this case. In Turkey, "Noise Control Regulation" (no.19308) was declared in 1986. With this regulation, noise sources, noise control top limits and methods for each source, and responsible authorities are clarified in details.

Source: a)

Noise Levels

Source of Noise	Maximum Noise Level (dBA)	Equivalent Noise Level (dBA)	Source of Noise	Maximum Noise Level (dBA)	Equivalent Noise Level (dBA)
Automobile	75		Residences (bedrooms)		35
Bus (in city)	85		Residences (living room)		60
Bus (outside city)	80		Residences (kitchen bathroom)		70
Trucks (at 50 km/h)	85		Commercial Buildings (private offices)		50
Electrical Train Locomotives	80		Street Level Stations (platforms)		70
Railroad Noise		65	Rock Drilling Guns		125
Industrial Noise (continuous)		65	Tractors		120
Industrial Noise (sudden)		70	Motoreycles		80
Construction Site Noise (building)		70	Impact Hammers		105
Construction Site Noise (road)		75	Compressors		105
Airports		70	Textile Looms		95
Theaters		25	Circular Saws for Cutting metal or wood		105
Hotel Rooms		30			

Source: g)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Law on noise	○	• Noise Control Regulation (no. 19308)
② Standard on noise level	○	• Noise Control Regulation (no. 19308)

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.4 Waste Management

Domestic wastes, medical wastes and industrial wastes form the major part of urban wastes. In Turkey, domestic wastes are collected with a system based on man-force. Wastes from collecting points to disposal areas are transported uneconomically. Besides, disposal methods of wastes are not sanitary; in 1991 81% of the urban waste was disposed in dump sites, 15% in seas, lakes and rivers, 2% was composted and 2% was burned. In the last years, waste production rate increases in Istanbul, Ankara, Izmit, Bursa, Eskisehir, Izmir, Antalya, Mersin, Adana and Erzurum.

Industrial wastes are not collected by the municipalities, so the amount and contents of these uncontrolled wastes can not be determined. 85-90% amount of medical wastes have domestic characteristics but, as collecting the wastes without separation medical wastes have hazardous characteristics.

According to the "Industrial Waste Inventory" and "Municipality and Household Solid Waste Trend Inventory" which were studied by DIE (State Statistics Institute);

- In Turkey, 53,319 tones of solid waste per day was collected in 1991. The number of municipalities that consider the "Solid Waste Control Regulation" rules on waste management is 32 and 5.1% of the municipalities have geological, topographical and hydrological researches during dump site selection.
- 41.6% of households separates the recycling materials.
- In 1992, 25 million tons of industrial waste was produced. 47% of this waste was sold, 36 % was disposed and 15% of it was recycled.

Source: a)

Related Agency
① Ministry of Environment
② Municipalities

Source: a)

Solid Waste generation, 1992	
Municipal⁽¹⁾	
Total (1000tonnes)	22,315
Per capita (kg/capita)	592
Industrial	
Total (1000 tones)	5,379
Per unit of GDP (kg/1000 USS)	25
Power plants⁽²⁾	
Total (1000 tones)	12,250
Per unit of energy (t/Mtoe)	3,861

⁽¹⁾ Data refer to 1991

All of 1974 municipalities, where garbage collection service is given, are included

⁽²⁾ All of 16 power plants are included

Source: SIS

Permitted Heavy Metal Content of Treated Sludge to be used in Agriculture

Heavy Metal	Permitted Maximum Value as Dry Material of Sludge (mg/kg)
Lead	1200
Cadmium	20
Chromium	1200
Copper	1200
Nickel	200
Mercury	25
Zinc	3000

Source: g)

Municipalities by amount of garbage, 1991			
	Number of municipalities	Amount of garbage (tones/day)	Per capita (kg/capita-day)
Turkey	1974	61,137	1.62
Adana	37	1,683	1.18
Ankara	45	3,732	1.28
Bursa	42	1,357	1.10
Gaziantep	22	790	0.91
Istanbul	43	10,898	1.55
Izmir	63	3,402	1.49
Kayseri	48	1,153	1.62
Konya	117	9,565	7.47

Source: SIS

Disposal of municipal waste, 1991		
	Waste Amount	
	(1000 tonnes)	(%)
Total	22,315	100.00
Municipality dumps	17,852	80.00
Regular storage	0	0.00
Incineration	0	0.00
Composting	381	1.71
Landfill	255	1.14
Sea, lake, river disposal	3,312	14.84
Other ⁽¹⁾	515	2.31

⁽¹⁾ Data refer to burning in an open area, burial, dumped to agricultural field

Source: SIS

Industrial solid waste generated by sector, 1992		
	Waste Amount	
	(1000 tonnes)	(%)
Total	5,378.7	100.0
Food, beverages, tobacco ind.	1,322.4	24.6
Textile ind.	969.7	18.0
Leather ind.	1.0	0.0
Paper and paper products	98.5	1.8
Chemical ind.	1,540.1	28.6
Rubber and plastics	1.3	0.0
Refineries etc.	0.3	0.0
Non-metallic mineral products	301.3	5.6
Basic metal ind.	1,144.1	21.3

Source: SIS

Solid waste recycling					
Paper and Cardboard			Glass		
Recycling rate (%)			Recycling rate (%)		
1985	1990	1993	1985	1990	1993
-	34	39	33	31	36

Source: SIS

Composition of municipal wastes (%) ^{a)}											
	Kg/cap	Paper and cardboard		Plastics		Glass		Metals		Others	
		1980	1985	1980	1985	1980	1985	1980	1985	1980	1985
Turkey	353	8.5	9.3	1.9	2.3	1.6	1.6	1.7	1.7	86.3	83.5
Canada	625	36.5	36.5	4.7	4.7	16.6	6.6	6.6	6.6	45.7	45.7
USA	864	29.7	34.7	5.3	6.7	10.3	9.6	9.6	8.8	45.1	40.8
France	303	28.0	27.5	6.0	4.5	11.0	5.0	5.0	6.5	50.0	54.0
W. Germany	318	19.9	17.9	67.1	5.4	11.6	3.9	3.9	3.2	58.5	64.3
Italy	301	22.5	22.3	6.8	7.2	6.7	2.9	2.9	3.1	61.4	61.6
Spain	322	15.0	15.0	6.0	6.0	6.0	2.5	2.5	2.5	70.5	70.5

a) Include organic substances such as waste food; in Turkey cinder represents a large part of municipal wastes (for example: in Istanbul, 42% in winter and 16.5% in summer; 32.4% in Ankara and 1% in Antalya over the full year).

Source: OECD (OECC)

① Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on waste	○	• Solid Waste control Regulation
② Laws on hazardous waste	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.5 Energy Conservation and Alternative Energy

Lignite and hydraulic energy are the two main energy source in Turkey. The potential and reserves of important primary energy sources in Turkey are given below:

Lignite	The hardcoal and lignite reserves of Turkey are 834.5 and 1718 million TOE. The Zonguldak Basin has an important potential of coal with its 1.358 billion tones reserve. The calorific value of the coal produced in this basin is 8400 kcal/kg. Turkey has lignite reserves nearly in every region but the calorific value of the most lignite reserves are quite low. For this reason, the great part of the produced lignite is used for electricity production.
Asphaltite	The asphaltite reserves are found in South East Anatolia. There exist 39 million tones of productable petroleum and 9.8 billion m ³ of productable natural gas reserve, according to the 1990 values.
Natural gas	The natural gas reserves are limited. The total determined natural gas reserve is 17.5 billion m ³ .
Hydraulic Energy	The regions of hydraulic potential asset are the East and Southeast Anatolia and East Black Sea. According to the studies of State Hydraulic Works(DSI); there are 702 dams and 504 hydroelectric power plants in operation and construction stage. In the average flow conditions, the gross hydraulic energy potential is determined as 433 billion kWh/year. In 1993, only 30% of this potential is used.
Geothermal Energy	The geothermal energy areas in Turkey suitable for electricity production are; Denizli-Kizildere, Aydin-Germencik, Çanakkale-Tuzla, Izmir-Seferihisar, Nemrut-Zilan-Süphan-Tendüruk and Nev çehir-Acıgöl. The potential geothermal electrical power production has been estimated to be 4500 MW, with a thermal capacity of 31 100 MW.
Solar Energy	In the Mediterranean and Aegean coasts, solar energy is widely used for water-heating. Turkey posses significant solar energy potential which has been estimated to be 26 million TOE thermal and 8.8 million TOE electrical.
Nuclear Energy	Turkey has one of the world's largest thorium reserves (380 000 tons) in Eski çehir-Sivrihisar-Beylikahir region. This reserve covers about 54 % of world's thorium reserve.
Wind Energy	The reliable data about wind energy does not exist. However, in many regions(especially Marmara Region), the wing power density reaches to over 20W/m ² . There isn't any application on electricity generation except two small scale demonstration projects with 55 kW and 1.1 kW power

Energy consumption both in households and in industries increases through industrialization, rapid population growth, increasing level of income. The average household energy demand in Turkey is 195 kWh/m².

In Turkey, producing and processing of energy sources, getting secondary sources, transferring and selling of these sources are under the responsibilities of governmental bodies. Controlling the environmental problems arising from the activities, which are carrying out by these institutions on energy sector, are under the responsibility of governmental organizations.

Energy

Total Primary Energy Supply by Sectors				
	1980	1985	1990	1993
Primary Energy Consumption (1000 toe)	31,913	39,167	53,334	61,018
Transformation Sector (1000 toe)	4,465	6,669	11,377	12,386
Net Energy Consumption (1999 toe)	27,448	32,498	41,957	48,631
Residential	46.54	43.70	37.40	36.00
Industry	28.98	30.10	34.60	34.00
Transport	19.05	19.10	20.80	21.40
Agriculture	3.51	4.60	4.70	5.00
Out of Energy	1.92	2.50	2.50	3.60

Source: Ministry of Energy and Natural Resources

Sectoral end uses	toe per unit value added			
	1980	1988	1990	1991
Industry	730	645	679	679
Transport	1203	1280	1367	1292
Agriculture	118	167	179	180
Residential/no. of resident	1.50	1.50	1.40	1.40

Source: Ministry of Energy and Natural Resources

Percent of Total Primary Energy Supply by Fuel Type (%)				
	1980	1988	1990	1993
TPES (1000 toe)	31,913	39,167	53,334	61,018
Coal	22.10	30.60	30.80	27.90
Natural gas	0.10	0.20	5.80	7.60
Petroleum	50.40	46.30	44.80	64.50
Hydraulic energy	3.00	2.60	3.70	4.80
Other ⁽¹⁾	24.40	20.30	14.90	13.20

⁽¹⁾ Includes wood, electricity, geothermal, solar, city gas and manure used as fuel

Source: Ministry of Energy and Natural Resources

Electricity Generation by Fuel Type					
		1980	1988	1990	1993
Electricity	Generation	23,275	34,219	57,543	73,808
	(Gwh)	3.9	2.1	1.1	2.4
	Hard Coal	21.70	41.80	34.00	29.00
	Lignite	-	0.20	17.70	14.60
	Natural gas	25.60	20.70	6.90	7.10
	Petroleum	48.80	35.20	40.20	46.00
	Hydraulic	-	0.02	0.10	0.10
	Geothermal				

Source: Ministry of Energy and Natural Resources

Energy

Proven Coal/Oil/Gas reserves		
	Million toe	(%)
Total	2,602.80	100.00
Hard Coal	834.50	32.06
Lignite	1,718.20	66.01
Petroleum	41.00	1.58
Natural gas	9.10	0.35

Source: Ministry of Energy and Natural Resources

Related Agency
① Ministry of Energy
② TEDAS

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on energy use and conservation	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.6 Water Supply

The total water potential of Turkey is 104.5 billion m³ per year. According to the 1996 data, water consumption was 34 billion m³ (17% of total freshwater resources) and 28 billion m³ of this was supplied from surface water and ground water resources. 14% of this volume was used for drinking water, 76% for irrigation and 10% for industrial use. Annual consumption of drinking water is 73 m³ per capita (100 m³ per capita in Europe).

100% of urban dwellers but only 85% of rural residents have access to safe drinking water. However, water supply for new residents and illegally settled areas is a problem. The amount of water needed will be 55 billion m³ in 2010 according to the estimates of DSI (The State hydraulic Works), 78% for irrigation, 13% for urban and 9% for industrial use.

Provision of public water supply is under the responsibility of municipalities and village councils in the rural settlements. The three central government organisation; DSI (State Hydraulic Works), İller Bank (Bank of Provinces) and General Directorate of Rural Affairs (KHGM) carry out the planning, construction and design projects of new systems except projects for large municipalities. Water and Sewerage Administrations which were formed under the body of greater municipalities have entity responsible for planning, design and construction of water supply projects of metropolitan cities.

Source: a)

Related Agency
① Bank of Provinces
② State Hydraulic Works
③ General Directorate of Rural Affairs

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on water resources and supply	?	
② Laws on use of water resources	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.7 Wastewater Management

Infrastructure services reach to 6% of the total population. Because of the lack of investment capital and inadequate staff, very high level of domestic waste water was discharged without treatment. Discharging of untreated waste waters into the surface water, contaminating of ground water resources by the leachate from sewage and open dump sites cause water quality degradation. In industrial scale, very low level of waste water are treated and management facilities of small scale industries are poor. Discharged waste water from industry and manufacturing is about 843 million m³ and discharged sewage is 70 million m³ in 1992. 69% of the waste water was not treated. 13% of it had a pre-treatment process. 58% of sewage was discharged without treatment.

In Water Pollution Control Regulation, industries and municipalities are allowed with restrictions to treat their waste water, industries discharging into local sewerage have to pre-treat their waste water.

Source: a)

Related Agency
① Ministry of Environment

Source: a)

Standards of Industrial Wastewater

Group	Type	Existing Standards on
Food Industry	Flour and macaroni production	BOD ₅ , COD, SS, pH
	Yeast production	BOD ₅ , COD, SS, pH
	Milk and dairy products	BOD ₅ , COD, Oil & Grease, pH
	Production and refining of oil seeds, excluding olive oil	COD, Oil & Grease, pH
	Olive oil and soap production, solid oil refining	COD, Oil & Grease, pH
	Slaughterhouses and integrated meal plants	BOD ₅ , COD, Oil & Grease, pH
	Fish and bone meal production	BOD ₅ , COD, Precitable Solids
	Processing plants for slaughterhouse by-products	BOD ₅ , COD, SS, Oil & Grease, pH
	Vegetable and fruit washing and processing plants	BOD ₅ , SS, pH
	Fish processing plants	BOD ₅ , COD, Fish Bioassay, pH
	Sugar production	BOD ₅ , COD, SS, Fish Bioassay
	Salt processing plants	SS, pH
	Fish farming	BOD ₅ , COD
Beverage Industry	Seafood processing	BOD ₅ , COD, Oil & Grease, pH
	Non-alcoholic soft drink production	BOD ₅ , COD, pH
	Alcohol and alcohol beverage industry	BOD ₅ , COD, pH
	Malt and beer production	BOD ₅ , COD, pH
Mining Industry	Production of alcohol from molasses	BOD ₅ , COD, Precitable Solids
	Preparation of iron and non-ferrous metal ores, calcium fluoride, graphite and similar ores	COD, Ss, Lead, Total Cyanide, Iron, Zinc, Free Sulfur, Fish Bioassay, Mercury, Cadmium, Copper, Total Chromium, pH
	Coal production and transportation	BOD ₅ , COD, pH
	Non-metallic mineral industry	COD, Boron, Fish Bioassay, pH
Glass Industry	Production of Earthenware vessels	COD, SS, Cr ⁶⁺ , Oil & Grease, pH
		COD, F, Ni, Ag, Pb, SO ₄ ²⁻ , pH
Coal Processing and energy Production	Preparation of anthracite and Lignite	COD, SS, Oil & Grease, Total Cyanide, Temperature, pH
	Coke and city gas production	COD, Oil & Grease, Total Cyanide, Phenols, Temperature, pH
	Thermal power plants	COD, SS, Oil & Grease, Total Phosphorus, Total Cyanide, Temperature, pH
	Nuclear power plants	Temperature, others set by TAEC
	Geothermal resources	COD, Oil & Grease, Total Cyanide, Temperature, pH
	Cooling waters	Oil & Grease, SS, Temperature, pH
	Closed circuit cooling waters	COD, SS, Free Chlorine, Total Phosphorus, Zinc
	Fuel oil and coal fired boiler cooling waters	Precitable Solids, Hydrazine, Total Phosphorus, Vanadium, Iron
Textile Industry	Staple fiber and thread production and finishing	BOD ₅ , COD, Ammonia, Free Chlorine, Total Chromium, Sulfur, Sulfide, Oil & Grease, Fish Bioassay, pH
	Woven fabrics finishing	BOD ₅ , COD, SS, Ammonia, Free Chlorine, Total Chromium, Sulfur, Sulfide, Phenols Fish Bioassay, pH
	Cotton textiles	BOD ₅ , COD, SS, Ammonia, Free Chlorine, Total Chromium, Sulfur, Sulfide, Oil & Grease, Fish Bioassay, pH
	Wool washing, finishing, weaving	BOD ₅ , COD, SS, Ammonia, Free Chlorine, Total Chromium, Sulfur, Sulfide, Oil & Grease, pH
	Knitted fabric finishing	BOD ₅ , COD, Ammonia, Free Chlorine, Total Chromium, Sulfur, Sulfide, Phenols, Oil & Grease, pH
	Carpet finishing	BOD ₅ , COD, SS, Ammonia, Free Chlorine, Total Chromium, Sulfur, Sulfide, Phenols, Oil & Grease, pH
	Synthetic textile finishing	BOD ₅ , COD, Sulfur, Phenols, Zinc, Fish Bioassay, pH

Group	Type	Existing Standards on
Oil Industry	Oil Refineries	BOD ₅ , COD, SS, Ammonia, Hydrocarbons, Cr ⁶ , Total Cyanide, Sulfur, Phenols, Oil & Grease, pH
	Petroleum filling plants	BOD ₅ , COD, SS, Hydrocarbons, Total Cyanide, Sulfur, Phenols, Oil & Grease, pH
Leather and leather Products Industry		BOD ₅ , COD, SS, Oil & Grease, Sulfur, Cr ⁶ , Total Chromium, Fish Bioassay, pH
Paper and Pulp Industry	Hemicellulose production	Flow, BOD ₅ , COD, SS, Precitable Solids, Fish Bioassay
	Cellulose production from wastepaper, straw and unbleached	Flow, BOD ₅ , COD, SS, Precitable Solids, Fish Bioassay
	Bleached cellulose production	Flow, BOD ₅ , COD, SS, Precitable Solid, Fish Bioassay
	Pure cellulose production	Flow, BOD ₅ , COD, SS, Precitable Solid, Fish Bioassay
	Non-starched paper production	BOD ₅ , COD, Precitable Solid
	Starch-reinforced paper production	BOD ₅ , COD, Precitable Solid
	Production of fine texture paper from pure pulp	BOD ₅ , COD, Precitable Solid
	Coated and filled paper production	BOD ₅ , COD, Precitable Solid
	Paper containing over 5% wood and a low percentage of scrap	BOD ₅ , COD, Precitable Solid
	Paper manufacture from scrap paper	BOD ₅ , COD, Precitable Solid
	Parchment paper	BOD ₅ , COD, Precitable Solid
Chemical Industry	Chlor alkali production	COD, Mercury, Active Chlorine, Fish Bioassay, pH
	Perborate and other boron products industry	COD, Boron, Fish Bioassay, pH
	Orpiment production	COD, Sulfur, Oil & Grease, Fish Bioassay, pH
	Dye production	BOD ₅ , COD, SS, Fish Bioassay
	Raw and auxiliary materials in dye production	COD, Cr ⁶ , Cd, Zn, Total Cr, Pb, Fe, Total Cyanide, Fish Bioassay, pH
	Pharmaceuticals industry	BOD ₅ , Fish Bioassay, pH
	Fertilizer production (containing Nitrogen and other Nutrients)	COD, SS, Total Cd, NH ₄ -N, NO ₃ -N, PO ₄ -P, F, pH
	Fertilizer production (containing only Nitrogen)	COD, SS, Total Cd, NH ₄ -N, NO ₃ -N, PO ₄ -P, F, pH
	Production of Phosphate Fertilizers and Phosphoric Acid (containing Nitrogen and other Nutrients)	COD, SS, Total Cd, PO ₄ -P, F, pH
	Plastics processing and plastic materials production	BOD ₅ , COD, SS, Oil & Grease, Total Phosphorus, Fish Bioassay, pH
	Medical and agricultural preparations	BOD ₅ , Fish Bioassay, pH
	Detergent production	COD, SS, Surface Active Substances, Total Phosphorus, pH
	Rubber production	BOD ₅ , COD, SS, pH
	Petrochemical and hydrocarbon production	BOD ₅ , COD, SS, Oil & Grease, Hydrocarbons, NH ₄ -N, Phenols, Sulfur, Hg, Cd, Zn, Pb, Cr ⁶ , Cu, Fish Bioassay, pH
	Soda production	SS, Chlorine, Fish Bioassay, pH
	Carbide production	Precitable Solids, Free Chlorine, Free Cyanide, SS, Fish Bioassay, pH
	Production of barium compounds	COD, Precitable Solids, Sulfur, Ba, Fish Bioassay, pH
	Dispersed Oxide production	Free Chlorine, Chlorine, Fish Bioassay
	Metal Industry	General iron steel production
Iron-steel processing plants		COD, Precitable Solids, Pb
General metal preparation and processing		COD, SS, Oil & Grease, NH ₄ -N, NO ₂ -N, Active Chlorine, Sulfur, Total Cr, Cr ⁶ , Pb, Total Cyanide, Cd, Al, Fe, F, Cu, Ni, Zn, Ag, Fish Bioassay, pH
Galvanizing		COD, SS, Oil & Grease, NH ₄ -N, Active Chlorine, Total Cr, Cr ⁶ , Pb, Total Cyanide, Cd, Al, Fe, F, Cu, Ni, Zn, Ag, Fish Bioassay, pH
Firing		COD, SS, Oil & Grease, NH ₄ -N, Active Chlorine, Total Cr, Cr ⁶ , Al, Fe, F, Cu, Ni, Zn, Fish Bioassay, pH
Electrolytic plating		COD, SS, Oil & Grease, NO ₂ -N, Active Chlorine, Total Cr, Cr ⁶ , Al, F, Cu, Ni, Zn, Fish Bioassay, pH
Metal tining		COD, SS, Oil & Grease, NO ₂ -N, Active Chlorine, Total Cr, Cr ⁶ , Fe, Ni, Fish Bioassay, pH
Hot galvanizing -- Zinc plating plants		COD, SS, Oil & Grease, NH ₄ -N, Cd, Fe, F, Zn, Fish Bioassay, pH
Quenching and hardening		COD, SS, Oil & Grease, NO ₂ -N, Active Chlorine, Total Cyanide, Fish Bioassay, pH
Conductive plating manufacture		COD, SS, Oil & Grease, NH ₄ -N, Sulfur, Total Cr, Cr ⁶ , Pb, Total Cyanide, Fe, F, Cu, Ni, Ag, Fish Bioassay, pH
Battery manufacture		COD, SS, Oil & Grease, NH ₄ -N, Sulfur, Pb, Hg, Cd, Fe, Cu, Ni, Zn, Ag, Fish Bioassay, pH
Glazing and enameling plants		COD, SS, Oil & Grease, NH ₄ -N, NO ₂ -N, Cr ⁶ , Pb, Cd, Al, Fe, F, Cu, Ni, Zn, Fish Bioassay, pH
Metal honing and sanding plants		COD, SS, Oil & Grease, NH ₄ -N, NO ₂ -N, Total Cr, Cr ⁶ , Pb, Total Cyanide, Cd, Al, Fe, F, Cu, Ni, Zn, Fish Bioassay, pH
Metal polishing and varnishing plants		COD, SS, Oil & Grease, Al, Fe, Cu, Zn, Fish Bioassay, pH
Lacquer and paint		COD, SS, Oil & Grease, Total Cr, Cr ⁶ , Pb, Cd, Al, Fe, Cu, Ni, Zn, Fish Bioassay, pH

Group	Type	Existing Standards on
	Non-ferrous metal production excluding Aluminum	COD, SS, Oil & Grease, Total Cr, Cr ⁶ , As, Pb, Total Cyanide, Hg, Cd, Fe, Cu, Ni, Zn, pH
	Aluminum Oxide and Aluminum smelting	COD, SS, Oil & Grease, Active Chlorine, Al, F, pH
	Iron and nonferrous metal foundries and casting plants	COD, SS, Oil & Grease, As, Total Cr, Cr ⁶ , Pb, Total cyanide, Hg, Cd, Al, Fe, Cu, Ni, Zn, pH
Wood Products and Furniture	Fiberboard, duralite, joinery, timber, boxes, packaging, shuttles	BOD ₅ , COD, Precitable Solids, pH
Mass Production of Machinery and Instruments and the Space Parts Industry		COD, Oil & Grease, NH ₄ -N, Cr ⁶ , Pb, Total Cyanide, pH
Automotive Manufacture and Repair Industry	Automobile and tractor repair shops	Oil & Grease, NH ₄ -N, Total Cyanide, Total Cr, Fish Bioassay, pH
	Automobile, truck, tractor, minibus, bicycle and motorcycle manufacturing plants	COD, SS, Oil & Grease, NH ₄ -N, NO ₂ -N, Free Cyanide, Total Cr, Cr ⁶ , Ni, Cd, Fe, Al, Pb, Cu, Zn, Hg, F, Fish Bioassay, pH
	Ship building and dismantling yards	COD, Oil & Grease, Total Cyanide, Total Cr, Fish Bioassay, pH
Mixed Industries	Small and large organized industrial zones and unclassifiable industries	BOD ₅ , COD, SS, Oil & Grease, Total Phosphorus Total Cr, Cr ⁶ , Pb, Total Cyanide, Cd, Fe, Ni, Zn, Hg, Fish Bioassay, pH
Other Industrial Wastewater's	Industrial cooling waters	COD, Oil & Grease, Fish Bioassay, Temperature, pH
	Exit waters from filters used to control air pollution	COD, SS, Sulfate, Fish Bioassay, Temperature, pH
	Gas station and car wash wasters	COD, Oil & Grease, Fish Bioassay, pH
	Glue and adhesive production	BOD ₅ , COD, SS, pH
	Backwash waters of drinking water filters	COD, SS, pH
	Solid waste recycling and disposal plants	BOD ₅ , COD, SS, Oil & Grease, Total Phosphorus Total Cr, Cr ⁶ , Pb, Total Cyanide, Cd, Fe, F, Cu, Zn, Fish Bioassay, pH
	Water softening, demineralization and regeneration, active carbon washing and regeneration plants	Chlorine, Sulfate, Fe, Fish Bioassay, pH

Source: g)

Status of wastewater facilities among manufacturing industry establishments, 1991

	Total	Having no wastewater treatment plant	Having wastewater treatment plant
Total	2,548	2,046	502
31	660	535	125
32	466	404	62
33	104	102	2
34	126	96	30
35	284	190	94
36	290	241	49
37	122	84	38
38	473	372	101
39	23	1	22

Source: SIS

Amount of discharged wastewater by type of receiving body, 1991

	Total amount of Wastewater discharged	
	(1000m ³ /year)	(%)
Total	1,033,501	100
City sewerage	155,491	15.15
Sea	589,183	57.00
Lake	9,001	0.87
Stream	251,347	24.32
Land	12,481	1.21
Dam	-	-
Septik tank	15,276	1.48
Other	722	0.07

Source: SIS

Sewerage Service Distribution for Urban Population

Served by septic tanks	43% (12.0 million)
Served by latrines	1% (0.3 million)
Served by sewerage systems	56% (16.0 million)
Served by proper wastewater treatment	6% (2.0 million)

Source: Environmental Policies in Turkey, 1992 (OECD)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on sewerage system	?	
② Laws and regulations on industrial effluent	?	
③ Effluent standard	?	
④ Results of monitoring	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.8 Forest Conservation/Desertification

Forest ecosystems include high mountain and alluvial forests and cover 20.2 million hectares where 56% are degraded. Deciduous forests are prevalent in Turkey and coniferous forests are found at varying altitudes from sea level to timberline. Humid, sub-humid coniferous, and dry forests (oak, black and red pine) as well as shrubs and maquis, are found in the Aegean and Mediterranean regions. 99% of the forests are under state ownership and the State Forestry Enterprises carries out the development, conversion and expansion of forests.

Farming and harvesting activities for fuelwood in forest villages and forest fires are the main reasons of deforestation and erosion. In Turkey, there are 17,797 villages near or in forest. The National Biodiversity Strategy and Action Plan lists the factors leading to a decline of biodiversity in Turkey's forests in order of priority below:

Source: a)

Related Agency
Forest Conservation ① Ministry of Forests
Ecological Zones ② Ministry of Environment ③ Ministry of Forests

Source: a)

Causes of Forest Degradation
1. Habitat alteration, fragmentation, and loss mainly due to agricultural and human population pressures.
2. Over-exploitation of plant species, frequently by over-grazing
3. Pollution: There has not been widespread use of chemicals (pesticides, herbicides, or fertilisers) on forests in Turkey, however, their use on agricultural lands adjacent to forests has been common and many bird and animal forest species are affected by their application.
4. Introduction of exotic species: In many cases exotic species became problematic by displacing the native species.
5. Degradation: Degraded forests should not be considered as "land banks" from which additional agricultural, pastoral, residential and industrial lands can be acquired, but as areas which need rehabilitation.
6. Industrial Agriculture and Industrial Forestry. Although genetically improved modern varieties show certain desirable qualities under intensive human care, they exhibit vulnerability because of reduced genetic diversity in their gene pools. Mono-cultures also reduce habitat diversity, especially in forest lands where micro-habitat differences are much needed for wildlife.
7. Global Climatic Change: Adaptive potential of many species, and populations, especially endemic plants will not be able to adapt to sudden climatic change, thus face extinction.

Source: a)

Turkish Forestry Principal Indicators

Indicators	FAO, 1995	MOF, 1997
Area Designated as Forest (million ha)	20.2	20.7
Growing Stock (million m ³)	759	1,083
Net Annual Increment (million m ³)	19.8	325
Fellings (million m ³)	7.2	178
Forest Cover (%)	26	26.7
Forest land per caput (ha)	0.34	0.35
Growing Stock per ha (m ³)	38	52
Fellings as percentage of Net Annual Increment (%)	37	54

Structure of the Forest

• Production forests	82.6%
• Protection forests	15.7%
• Conservation forests	1.6%
• Natural parks	0.2%
• National parks	1.4%
Total	100%

Forest land area in the last decade		
	Area (km ²)	(%)
Forest land	201,993	100.00
Softwood forest land	85,150	42.15
Hardwood forest land	107,693	53.32
Mixed forest	9,150	4.53
Protected forest land	8,320	4.10
Area covered by forest quality	201,993	100.00
Productive	88,565	43.80
Unproductive	113,428	56.20
Reforestation land	1,271	0.60
Forest removal by fire	1,422	0.70
Biological diversity		
(# of species in "virgin forests") over 300 plant species		

Source: Ministry of Forestry

Growing stock in the last decade	
Growing stock	(1000 m ³)
Softwood	
Softwood forest land	593.107
Hardwood forest land	548.699
Hardwood	
Productive	219.975
Unproductive	210.033
Total growing stock	813.082

Source: Ministry of Forestry

Afforestation, Erosion Control, Improvement of Pastures and Energy Forest Activities

Years	Afforestation within forest (hectares)	Afforestation outside forest (hectares)	Erosion control (hectares)	Improvement of pastures (hectares)	Artificial regeneration (hectares)	Energy forest facility (hectares)	Energy forestry renewal (hectares)	Total (hectares)
Start until end of 1982	644,269	26,410	125,424	40,843	25,990	28,204	17,541	1,138
1983	63,785	2,425	13,635	3,915	21,450	19,552	7,234	131
1984	85,471	2,156	12,608	1,838	17,776	33,602	7,157	160
1985	98,198	2,211	15,907	3,395	17,342	46,793	8,813	192
1986	106,875	1,834	12,080	2,189	19,840	54,956	10,538	208
1987	111,057	2,987	13,964	2,460	23,668	60,352	19,258	233
1988	114,898	4,671	23,86	3,640	24,246	61,600	16,790	249
Total	1,224,553	42,694	217,424	58,280	380,312	305,059	87,331	2,315

Source: the Turkish Forestry in the 150th year of its establishment (ankara/1989). (OECD)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on forest conservation	○	• Forest Law No. 6831
② Laws and regulation on protection area	?	
③ Laws on desertification	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.9 Biodiversity

Turkey has different climatic, geological and soil structure features and this creates varied vegetative cover. There are three regions in terms of vegetation cover.

- European-Siberian region: covers Black Sea Region, central and northern Marmara region. Forest trees and plants require moisture are dominant.
- Aegean-Mediterranean region: forest trees, scrubs and steppe plants constitutes the vegetation.
- Iran region, steppe plants are dominant.

These regions have four sensitive habitats: wetlands, shores, mountainous areas and steppes. There are 300 wetlands covering one million hectares, 61 of them are significant bird areas. There exist many mountain ecosystems; 130 mountains have peaks over 3,000 meters, 10 mountain has an importance in terms of winter sports and tourism (Ölker, 1992). Another important ecosystems are shores which require specific management approaches. The steppes are also sensitive areas.

Turkey has the 75% of plant species found in Europe. Some species such as cherry, fig, tulip are originated in Turkey. Over 33% of the flora are endemic species. Studies indicated that there are 163 plant family including 1,225 types expanded to 9,000 species.

Rapid population, urbanisation, industrialisation and uncontrolled tourism development put pressure to ecosystems and ecologically significant areas. However, governmental policies on land-use and natural resource management are ineffective.

Source: a)

Related Agency
Ecological Zones
① Ministry of Environment
② Ministry of Forests
Biological Diversity
③ Ministry of Environment
④ Ministry of Forests
⑤ Society for Protection of Nature

Source: a)

Numbers of described, endemic, rare and extinct plant and animal species in Turkey

Plants and Animal Groups	Described Species	Endemic Species	Rare and endangered Species	Extinct Species
PLANTS				
Non-vascular Plants				
Algae	4500			
Mosses	234			
Lichens				
Vascular plants	8950	3072	3011	12
Ferns	78	1		
Seed plants	8869			
Gymnospermae	22	3		
Angiospermae	8850	3068		
Monocotyledons	692			
Dicotyledons	8155			
ANIMALS				
Invertebrates	160000			
Unicellular	65			
Nematodes	1			
Molluscae	190			
Crustaceae	556			
Vertebrates				
Pisces (incl. marine)	508	2	17	
Amphibians	22	2		
Reptilians	105451	4	5	
Aves	132		39	1
Mammalian		1	25	7

Source: National Biodiversity Strategy and Action Plan, 1997)

National Park (Total: 23 places)

Name	Location	Area (ha)	Established year
1. Yozgat Pine Grove National Park	Yozgat province	264	1958
2. Karatepe Aslantas National Park	Adana Province	7,515	1958
3. Soguksu National Park	Kizilçahaman, Ankara province	1,050	1959
4. Kusçenneti National Park	Manyas Kus Lake	64	1959
5. Uludag National Park	Bursa province	11,338	1961
6. Yedigöller National Park	Zonguldak province	2,019	1965
7. Dilek Peninsula Menderes Delta National Park	Aydin province including Menderes Delta	27,675	1993 (expanded)
8. Mount Spil National Park	Manisa province	5,505	1968
9. Kizildaga National Park	Isparta province	59,400	1993
10. Termessos-Mount Güllük National Park	Antalya province	6,702	1970
11. Kovada Lake National Park	Isparta province	6,534	1970
12. Munzur Valley National Park	Tunceli province	42,000	1971
13. Olympos-Beydaglari National Park	Antalya province including Kemer and Kumluca districts	34,425	1988
14. Gelibolu Peninsula National Park of History	Eceabat-a district in Çanakkale province	33,000	1973
15. Köprülü Canyon National Park	Antalya province	36,614	1973
16. Mount Ilgaz National Park	Kastamonu province	1,088	1976
17. Baskomutan Historical National Park	Afyon and Kütahya province	47,300	1981
18. Göreme Historical National Park	Nevşehir province	9,572	1986
19. Maçka Altindere Valley National Park	Trabzon province	4,800	1987
20. Bogazköy Alachhöyük Historical National Park	Çorum province	2,634	1988
21. Mount Nemrut National Park	Adiyaman province	13,850	1988
22. Beyşehir Lake National Park	Konya province	88,750	1993
23. Kazdagi National Park	Balikesir province	21,300	1993

Source: National Parks and Wildlife in Türkiye, 1993

Designated Area for Nature Conservation

Name	Number
Nature Park	8
Nature Conservation Area	23
Natural Monument	2
Rest Areas set in Forests(Camp and Picnic Grounds)	415
• (A) Class Rest Area	(44)
• (B) Class Rest Area	(117)
• (C) Class Rest Area	(254)
Wildlife Conservation Area	97
Game Breeding Stations	41
Game Stocking Area	30
• Stocking Area	(20)
• Stocking in Conservation Area	(2)
• Stocking Areas under Trial Programs	(8)

Source: National Parks and Wildlife in Türkiye, 1993

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on protection for fauna and flora	○	• Law No. 2634 on Encouraging Tourism
② Laws and regulations for protection for specific species	?	
③ Laws and regulations on hunting	?	
④ Laws and regulations on protection area	?	
⑤ Listed species in the Red Data Book	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.10 Natural Resource Management

Water Sources

Turkey has a great potential of freshwater resources. There are 200 natural lakes with a total surface area of 500,000 ha; 48 of which has over 5 km² surface area. 775 dam lakes and ponds with a total surface area of 165,000 ha. Among the 26 main catchment area, the Euphrates Basin which covers the 16% of the country land, is the largest. The three important domestic water resources are the Sakarya, Kızılırmak and Yesilirmak Rivers. Average annual rainfall is about 501 billion m³. 41 billion m³ of the total seeps underground and feeds the groundwater reserves, 186 billion m³ of it reaches to surface waters.

The Southeastern Anatolia Project (GAP), that covers more than 70,000 km², includes the rivers of Euphrates and Tigris Rivers. This project which was planned by State Hydraulic Works, includes 13 sub-projects for irrigation and hydropower generation. The project contains the construction of 21 dams and 17 hydroelectrical power plants. It is planned that 1.6 million hectares of land will be irrigated and 26 billion kWh of electric energy produced. Atatürk Dam, the ninth biggest dam in the world, has completed within this project.

Soil Resources

Soil resource is one of the most important natural sources in Turkey. 35 % of the total land surface is suitable for agricultural use. Besides; forests and grasslands are began to be cleared for farming. The land was divided into 8 classes by the General Directorate of Rural Affairs.

The regional distribution of cultivable land is unbalanced. The Marmara and Central-North Regions where the population density and non-agricultural activities are intensive, has 30% of the total cultivable land.

The soil resources are under the threat of degradation and pollution because of the facts such as excessive chemical usage in agriculture, using fertile lands for non-agricultural purposes and erosion.

In Turkey, the use of fertilizes has increased from 2.0 million tons in 1970 to 4.4 million tons in 1995. Besides the pollution causing from fertilizers and pesticides, pollution causing from the thermal plants, borax mines and other industrial activities affect the fertile land. 64,000 ha of land in the plains of Bahkesir, Kepsut and Karacabey are polluted by borax mines.

In Turkey, land is used for many purposes such as housing, industry and public sector investment because of rapid development. About 1 million ha of fertile land (Class I-III) were converted to non-agricultural purposes.

Erosion is considered as the most severe problem because 500 million tons of top soil are lost every year by water and wind erosion.

Protection of soil resources in Turkey requires changes in land use policies and legislative arrangements. The Eastern Anatolia Watershed Rehabilitation Project financed by World Bank on reforestation, improvement on range management and farming is being implemented in Malatya, Elazığ and Adyaman since 1993.

Wetlands

The wetlands which are considered to be the most important ecosystems of the world, are also amongst the most important ecological assets of Turkey. 75% of the wetlands are larger than 100 ha. Wetlands that have the quality of the class "A" according to the international criteria are: Lake Manyas, Lake Seyfe, Sultan Reed-bed, Göksu Delta, Lake Burdur, Lake Gala, Yumurtalık Lagoon and Menderes Delta. 5 wetlands are declared as Ramsar Site. The wetlands in the West and South of the country have been surveyed up till today but there are dozens of wetland ecosystems in the East.

1.343 million ha of wetlands have an international importance as they provide shelter for 400 bird species. Besides, the two major bird migration routes cross in Turkey and 250 bird species use Turkish wetlands.

The drainage of the wetlands is still one of the main problems. Draining of wetlands was started in the 1950s under the responsibility of State Hydraulic Works. 190,000 ha of wetland area were drained by 1986. Using the natural lakes as a reservoir and pollution created by the waste water discharges destroy the ecological structure of the wetlands and damage the aesthetic valuables.

Source: a)

Related Agency
① Ministry of Environment
② Ministry of Forests
③ State Hydraulic Works

Source: a)

Water Resources of Turkey

Resource	Number	Surface area, length, volume
Natural Lakes	200	5,000 m ³
Dam Lakes	75	1,500 m ³
Ponds	700	150 m ³
Rivers and Streams	33	175,715 km
Underground waters		94 billion m ³
Average rainfall		652.5 mm

Source: Central Directorate of State Hydraulic Works, Turkey

Surface Waters

Annual Surface Runoff	186.05 km ³
Annual Surface/Rainfall Ratio	0.37
Annual Depletable Volume	95.00 km ³
Actual Annual Utilization	27.50 km ³

Groundwaters

Annual Extractable (available)	12.2 km ³
Groundwater Reverse	
Annual Volume Allocated by DSI	7.6 km ³
Actual Annual Utilization	6.0 km ³

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on conservation of natural resources	?	
② Laws on use and conservation of mining resources	?	
③ Laws on underground resources	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.11 Natural Disasters

Turkey is under the risk of natural disasters because of its climate, topography and geology. Over the past 70 years, 600,000 houses have been damaged; 66% by earthquakes, 15% by floods, 10% by landslides, 7% by rock falls and 2% by meteorological events. Over the same period, about 70,000 people were died and 120,000 people were injured in earthquakes. At present, more than 51% of the population, 75% of industries and 43% of landmass of Turkey is located in the two main earthquake zone. In 1939, a massive earthquake was happened with 8 Richter scale in Erzincan and 30,000 people were died beside 17,500 were injured.

In Turkey, human behaviors such as settlement in risk areas, poor maintenance of protective systems increase the risks of natural disasters. The flood that happened in Izmir in 1995 is one of the most dramatic example; 63 people were died. Besides, measures for emergencies are insufficient.

Source: a)

Related Agency
① General Directorate of Natural Disasters

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on natural disaster	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

4.12 Environmental Education

One of the main cause of environmental problems in Turkey is the deficiency of public awareness. The Sixth Five-Year Development Plan emphasizes the education of the people on subject of environment in Turkey.

For improving education on the environment quantitatively and qualitatively and making it more widespread, national education policies and strategies have been set out within the framework a national environment education strategy and plans of action. Environmental education is planned to be executed within the national education policy under 3 major targets (Schools and universities, public awareness, service sector).

In formal pre-school, primary/middle/high school, and in special programs environmental education is provided. Besides, environmental courses and programs including ecology, environmental law and policies for undergraduate and postgraduate levels are offered in 21 Turkish university. (TMMOB, 1997)

There are some university groups and clubs studying on the environment and nature. Non-formal education programs including environmental education and training, attract about one million people a year.

Although many environmental courses and training programs exist, there are many problems arising because of outdated technology and equipment use and dissemination of outdated information.

Source: a)

Related Agency
① Ministry of Education

Source: a)

Laws and Regulations	Presence	Name of Laws or Regulations (Reference)
① Laws on education	?	
② Guidelines on environmental education	?	

Note: ○ : Issued, × : None, △ : Under planning, ? : Unknown

5. INTERNATIONAL RELATIONSHIP

Turkey had become party to 38 conventions, signed 29 declarations and enacted 15 bilateral agreement by 1997. Besides, Turkey participates in the activities of the international organisations like UNEP, UNDP, OECD, NATO, EC, ECE, IUCN, WWF, WHO, WB and CSCE.

Being very active in the field of environmental issues in the Mediterranean and Black Sea regions, Turkey is generally maintains a high profile in the area.

5.1 International Convention

Name of international Convention	Year
1) The Barcelona Convention	1981
a) Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea	1981
b) Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean	1986
c) Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities	1987
d) Protocol on Hazardous Wastes Transboundary Movements	1996
2) The Regional Agenda 21 Plan for Central Asia and Balkan Republics	1994
3) The Establishment of a Regional Environmental Center for Central Asia and the Caucasus	no information
4) The Black Sea Convention and Strategic Action Plan for the Rehabilitation and Protection of the Black Sea	1996
5) Whale Hunting Convention	1934
6) European Cultural Agreement	1957
7) Protection of Cultural Assets during Conflicts Agreement	1965
8) European Mediterranean Plant Protection Agreement	1965
9) Nuclear Test Ban Treaty	1965
10) International Bird Protection Agreement	1966
11) Mediterranean Fisheries Protection Agreement	1967
12) Nuclear Energy Control Agreement	1967
13) Peaceful Use of Outer Space	1968
14) Protection of Workers against Radiation	1969
15) International Civil Standards	1971
16) European Agreement on International Transport of Animals	1971
17) Ban on Marine based Nuclear and Other Weapons of Mass Destruction	1972
18) Biological and Toxic Waste Management	1972
19) Barcelona Convention on the Protection of the Mediterranean Sea from Pollution	1981
20) Mediterranean Shipping and Aviation Pollution Control Protocol	1981
21) International Energy Programme Agreement	1981
22) Mediterranean Petroleum and Dangerous Product Protocol	1981
23) Transboundary Air Pollution Agreement	1983
24) Treaty on the Conservation of the World Heritage and Natural Heritage	1983
25) Treaty on the Protection of Wildlife of Europe and its Habitats	1984
26) Antarctica Treaty	1995 and 1996
27) Protocol on Specially Protected Areas in the Mediterranean Sea	1986
28) Protocol on Protecting the Mediterranean Sea from Land Based Sources of Pollution	1987
29) Montreal Protocol on Substances depleting ozone layer	1990
30) Nuclear Accident Agreement	1990
31) MARPOL Convention	1990
32) RAMSAR Convention on Important Wetlands as the living environment for Wildbirds	1994
33) London and Copenhagen Amendments to the Montreal Protocol	1994
34) Basle Convention on the shipments of hazardous waste and other wastes	1994
35) Rio Convention on Biodiversity Protection	1996
36) Black Sea Convention	1994
37) Black Sea Protocol on dangerous materials	1994
38) Black Sea Protocol on the protection of Coastal Zones from effluent	1994
39) CITES Convention	1996

Source: a)

5.2 International Cooperation Project

Name of Project (Project cost: million dollars)	Period	Donor/South African lead agency
(no information)		

Source:

6 INFORMATION SOURCE

6.1 Governmental Agency

Name of Organization	Contact Address
a) Meteorological characteristics • General Directorate of Meteorology	(no information)
b) Ecological Zones • Ministry of Environment • Ministry of Forests	(no information)
c) Land-use • State Planning Organisation	(no information)
d) Demographic Features • State Institute of Statistics • State Planning Organization	(no information)
e) Environmental Policy Laws and Regulations Organization • Ministry of Environment • Ministry of Forestry • State Planning Organization	(no information)
f) Atmospheric Pollution • State Institute of Statistics • Ministry of Environment	(no information)
g) Water Pollution • State Hydraulic Works • Ministry of Environment	(no information)
h) Other Pollution • General Directorate of Rural Affairs • Ministry of Environment	(no information)
i) Waste Management • Ministry of Environment • Municipalities	(no information)
j) Energy Conservation/alternative energy • Ministry of Energy • TEDAS	(no information)
k) Water Supply • Bank of Provinces • State Hydraulic Works • General Directorate of Rural Affairs	(no information)
l) Waste Water Management • Ministry of Environment	(no information)
m) Forest Conservation • Ministry of Forests	(no information)
n) Biological Diversity • Ministry of Environment • Ministry of Forests • Society for Protection of Nature	(no information)
o) Natural Resource Management • Ministry of Environment • Ministry of Forests • State Hydraulic Works	(no information)
p) Natural Disasters • General Directorate of Natural Disasters	(no information)
q) Environmental Education • Ministry of Education	(no information)
r) International Issues • Ministry of Environment	(no information)

Source: a)

6.2 International Organization

Name of Organization	Contact Address
a) European Union (EU)	Ugur Muncu Caddesi No:88 Kat:4, Gaziosmanpasa Tel: (312) 437 68 40-43 Fax: (312) 437 79 40
b) United Nation (UN)	Ataturk Bulvari No:197 Kavaklidere Tel: (312) 426 54 85-89 Fax (312) 426 13 72
c) Food and Agriculture Organization (FAO)	Ataturk Bulvari No:197 Kavaklidere Tel: (312) 428 06 64-468 75 13 Fax: (312) 427 48 52
d) United Nations High Commissioner for Refugees (UNHCR)	Abidin Davar Sok. No:17 Cankaya Tel: (312) 439 66 15-18 Fax: (312) 438 27 02
e) United Nations Children's fund (UNICEF)	Iran Caddesi No:35, Gaziosmanpasa Tel: (312) 427 86 03-427 85 61-64
f) International Labor Organization (ILO)	Ataturk Bulvari No:197 Kavaklidere Tel: (312) 428 51 83-428 70 76 Fax: (312) 427 38 16
g) World Health Organization (WHO)	Ataturk Bul.No:197 Kavaklidere Tel: (312) 428 40 31 Fax: (312) 467 70 28
h) Foundation for Islam Statistics Social and Education	Altar Sok. No:4, Gaziosmanpasa Tel: (312) 468 61 72-47 Fax: (312) 467 34 58
i) World Bank	Ataturk Bul. No:211 Kat:6, kavaklidere Tel: (312) 468 45 27-30 Fax: (312) 468 45 26

Source: c)

6.3 Non-governmental Organisation (NGO)

Name of Organization	Contact Address
a) The society for the Protection of Nature	(no information)
b) The Society for the Conservation of Nature in Turkey	(no information)
c) Environmental Problems foundation of Turkey	(no information)
d) Society for the Prevention of Air Pollution	(no information)
e) Cancerology and Ecology Association	(no information)
f) Solar Energy Research Foundation	(no information)
g) Foundation for the conservation of Environment-Monument-Touristic Assets of Turkey	(no information)
h) Aegean Environmental Health Center Association	(no information)
i) Soil Science Association	(no information)
j) Society for the Preservation of Plants of Turkey	(no information)

Source: a)

6.4 Embassy

Name of Organization	Contact Address
Embassy of Japan	• Resit Galip Caddesi 81, Gaziosmanpasa, Ankara, Turkey Tel: (312) 446 05 00 Fax: (312) 437 18 12
Consulate of Japan	• Inonu Cad. No:24 Taksim Tel: (212) 251 76 05 Fax: (212) 252 58 64
Embassy of Turkey	• 2-33-6 Jingumae, Shibuya-ku, Tokyo 150-0001 Tel: 03-3470-5131

Source: f)

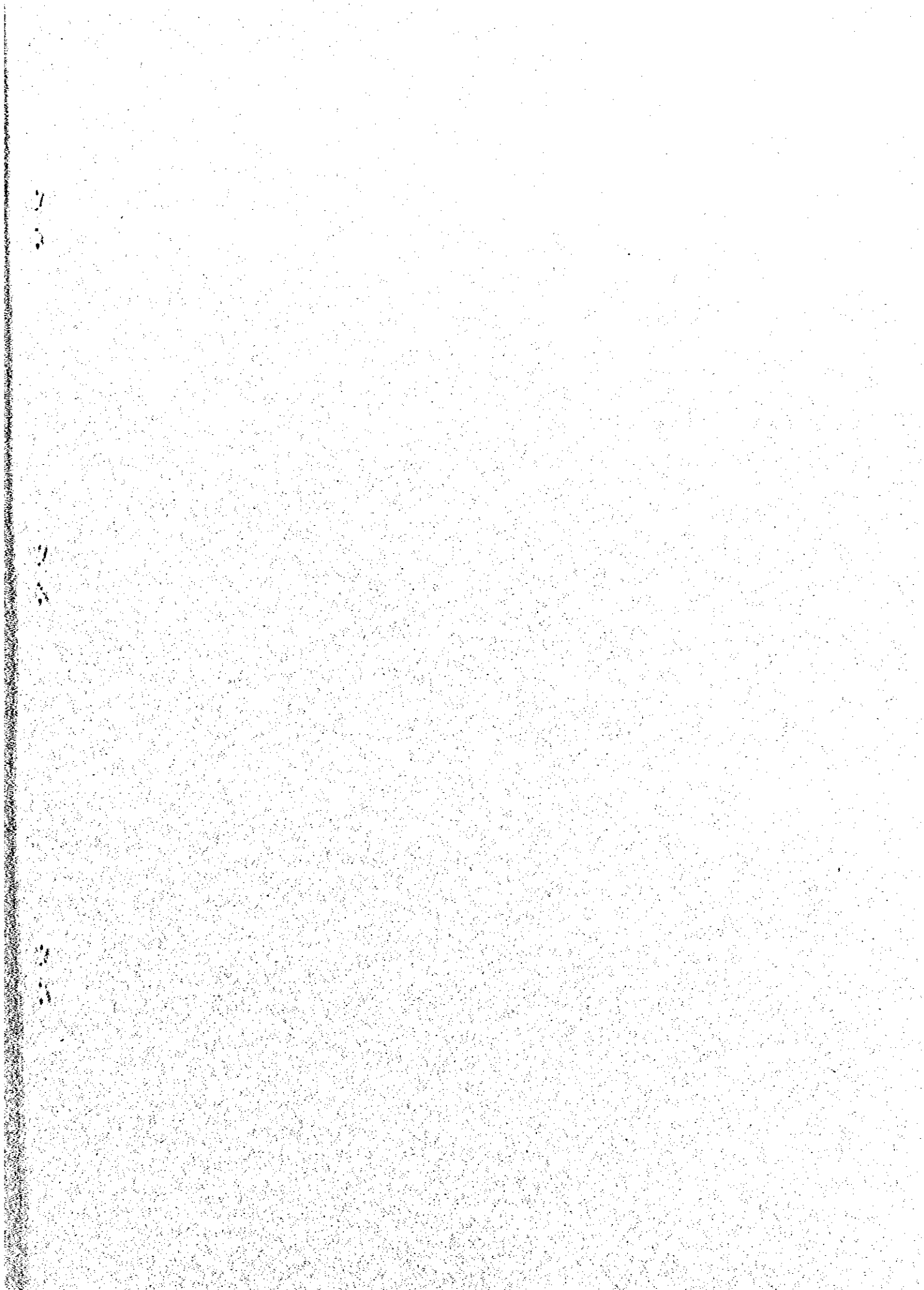
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 - a-12) Seventh Five-Year Development Plan (1996-2000), Department of Public Relations and Publications, State Planning Organisation, Ankara, 1995.
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