

## **FRESHWATER COUNTRY PROFILE**

### **TURKEY**

#### **Decision-Making**

#### **Programmes and Projects**

- A. Integrated Water Resources Development and Management
- B. Water Resources Assessment
- C. Protection of Water Resources
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- E. Water and Sustainable Urban Development
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#### **Status**

#### **Capacity-Building, Education, Training and Awareness-Raising**

#### **Information**

#### **Research and Technologies**

#### **Financing**

#### **Cooperation**

**Decision-Making:** *Sustainable development.* Responsibilities with regard to integrated decision-making in sustainable development or/and development issues in general could be attributed to: the State Planning Organization; the Ministry of Foreign Affairs; the Ministry Interior; the Ministry of Environment and Forestry; National Environment Council; Higher Commission of Environment; and Supreme Board of Planning. Environmental Impact Assessment became a legally required procedure on February 7 1993, and is currently under revision in terms referring an integrated way of thinking.

Turkey has a National Environmental Action Plan (NEAP) for the years 1996-2000. It is a binding document for the public sector and serves as a guidance document for the private sector. In addition, certain sectors such as: tourism; industry; energy; transport; and agriculture are working towards the integration of environmental considerations. In 1995, Turkey launched a preparatory process for the development of a National Agenda 21 under the United Nations Development Programme (UNDP) technical cooperation programme entitled the “National Programme for Environmental Institution and Management in Turkey”. The report, which identifies actions to ensure the integration of social, environmental, and economic concerns and policies at national level, has been prepared. The NEAP; National Programme for EU Integration; and the Eight Five-Year Development Plan (2001-2005) are used as important references in the achievement an integrated decision-making.

A National Committee involving representatives from: all relevant government agencies; NGOs; local authorities; academic institutions; private sector; and the media has also been set up to draft the action plan. Regional workshops have been organized to review drafts.

*Freshwater:* Main coordinating bodies for freshwater issues are: the State Planning Organization; General Directorate of State Hydraulic Works; General Directorate of Rural Services; the Ministry of Environment and Forestry; the Ministry of Health; the Ministry of Public Works and Settlement, the Ministry of Tourism; the General Directorate of Bank of Provinces; and Greater Municipalities.

According to the Constitution, all water rights to both ground and surface waters, with the exception of some privately owned springs are vested in the State. The 1071 Law on Water Resources (as amended in 1986) stipulates that private withdrawal of ground and surface waters requires licensing by the State. By law, priority is given to drinking water provision, although there have been cases where other uses, such as irrigation of hydropower generation, have been given precedence. The 1988 Regulation on Water Pollution Control sets out principles for classifying ground and surface water quality planning. This regulation aims at both conserving the quality of water resources in ecosystems and protecting and improving water quality to meet national requirements. It prescribes protection zones and land use strategies in regard to reservoirs and lakes used for drinking water. Principles for discharging effluent to ground and surface waters, and for treating wastewater, are also contained in the regulation. Integrated Pest Management (IPS) Instructions will be prepared and applied in a short period of time.

General and specific objectives for urban and rural infrastructure development, related to water resource management are:

- Drinking water needs of settlements with no or insufficient drinking water shall be met; all villages shall receive drinking water; works to meet cities’ long-term water requirements shall be completed;
- Water losses shall be reduced to reasonable levels and the efficiency of water use in agriculture shall be improved;
- Water supply and wastewater treatment pricing shall cover operational and maintenance costs and generate fund for new investments; water and sewerage administrations shall be established in cities with over 100 000 inhabitants;
- Rural infrastructure shall be developed and irrigated land extended by 735 000 hectares;
- Transfer to users of irrigation facilities shall be accelerated, and recovery of public investment shall be

- established;
- Rehabilitation of lakes and rivers threatened by pollution shall be given importance;
- Water management by river basin shall be given priority.

The Environment Law, which came into force in 1983, endorses the “polluter pays” principle and handles environmental issues in a very broad scope. Turkey stresses the importance of environmental impact assessment (EIA) in order to have a less polluting and safer transport system.

### **Programmes and Projects:**

A. Integrated Water Resources Development and Management: The 195 dams built to date have created artificial lakes occupying about 380 000 hectares. On the other hand, the Southeastern Anatolia Project (GAP) aims to develop an area of more than 7 million hectares within the basins Dicle (Tigris) and Fýrat (Euphrates) which constitute 30 Per cent of Turkey’s total river flow. It includes 13 subprojects to be completed over a period of ten years; 1.7 million hectares will be irrigated of which 10 Per cent (175 000 hectares) has already been put under irrigation. The Atatürk Dam has a capacity to irrigate 882 000 hectares.

B. Water Resources Assessment: Water quality is monitored throughout Turkey by local health inspectors within a national programme. Inspectors have the authority to prosecute polluters with a broad range of regulations until the contamination is eliminated.

C. Protection of Water Resources, Water Quality and Aquatic Ecosystems: The Ministry of Environment and Forestry and Forestry has prepared several protection projects in different water basins. The main target of the projects is to prevent pollution and protect fresh water and drinking water resources. Among these projects: “Protection of Sapanca Lake as a Drinking Water Resource”; “Protection of the Eđirdir Lake as a Drinking Water Resource”; and the “Protection of Existing and Potential Drinking Water Resources in Istanbul” have been completed. New wastewater treatment facilities have been installed.

The Integrated Watershed Management Project is being implemented in the upper Euphrates Basins (eastern part of the country) for erosion control. The Project also supports farmers in the catchment basin in order to improve their living standards.

By the end of the year 2001, the number of Small Industrial Estates and Organized Industrial Estates constructed were 349 and 65 respectively. At present, the number of ongoing projects of Small Industrial Estates and Organized Industrial Estates are 141 and 210 respectively. Some Organized Industrial Estates have wastewater treatment facilities. The main objective of the Ministry of Industry and Trade is to have constructed wastewater treatment facility in all Organized Industrial Zones.

D. Drinking Water Supply and Sanitation: A project titled “Protection Sapanca Lake as a Drinking Water Resource” has been implemented by the Ministry of Environment and Forestry. The philosophy of the project was the integrated management of potable water resources, and beneficial use and protection of the basin. On the basis of the project, a plan has been prepared for the beneficial use and protection of the basin and presented as 1:25,000 scale maps. These maps, which included land use limitation criteria, will be used by land use planners during the preparation of a 1:25,000 scale basic land use plan.

The Ministry of Tourism carried out a project, “Mediterranean-Aegean Tourism Infrastructure and Coastal Zone Management” (ATAK) which covers 130 settlements on 4000 km of coastline, aiming to complete the infrastructure needs concerning water supply; and wastewater and solid waste collection and disposal. The project provides also a new institutional arrangement for private sector participation. See also under C. Protection of Water Resources, Water Quality and Aquatic Ecosystems.

Directive on Swimming Water, Directive on Water for Human Consumption and Directive on Mineral Waters have been harmonized with the European Union's relevant directives by the Ministry of Health. The Ministry has also embarked on a project on "Water and Biosidal Products-2004".

E. Water and Sustainable Urban Development: See under C. Protection of Water Resources, Water Quality and Aquatic Ecosystems and D. Drinking Water Supply and Sanitation.

F. Water for Sustainable Food Production and Rural Development: The General Directorate of Rural Services undertakes leveling works for: the use of water available in the agricultural areas under all circumstance and the water taken from irrigation facilities founded by the state in agriculture; extends agricultural irrigation services such as main field channels, in-field irrigation and drainage facilities; and other required services.

General Directorate of Rural Services establishes and administrates facilities for water that has irrigation water needs up to 500 liter/second. It supplies improves develops and administrates established facilities with the same objective (This provision is not valid for the construction of dams and regulators in order to produce electricity. The approval of General Directorate of State Hydraulic Works (DSY) is required for the facilities to be established on waters, which have the industrial consumption above 500 liter/second).

There is a project in place to undertake drop and rain systems, based on the principle of common participation with the World Bank, together with Irrigation Unions. Undertaking the administration and maintenance works by Irrigation Unions is another component of the project. The goal of the project is that the level of irrigated agriculture will be increased to 1,650,000 ha. It is planned to implement the pilot project, which is under the preparation stage, countrywide in order to prepare agricultural land use maps.

G. Impacts of Climate Change on Water Resources: A Specialized Commission on Climate Change was established under the studies of the Eighth Five Year Development Plan for the period 2001-2005, in 1999. As a result of this positive development, the climate change concern has taken place in the development plans of Turkey for the first time.

**Status:** *Socio-economic aspects*: The absolute poverty level, which can be defined as the level at which basic food expenditures, necessary for a healthy life cannot be afforded, was 8 percent in Turkey by the year 1994. According to the basic requirements approach, which considers food and other consumption needs as a whole, the rate of the population under risk of poverty, is about 24 percent. The absolute poverty level of rural and urban areas are 11,8 percent and 4,6 percent respectively, whereby the rate of the population under risk of poverty by basic consumption needs is 25,4 percent for rural areas and 21,7 percent for urban areas. 95 percent of the population in absolute poverty consists of those whose educational level is either primary school or below and of illiterate people. With a share of 50 percent within the working group, unpaid family workers constitute the greatest poor group. This section is followed by the self-employed with 24,7 percent and wage earners with 16,6 percent. When considered according to economic activity fields, with a share of 73,5 percent within the population in poverty, those dealing with agriculture and forestry constitute the greatest group in poverty. On the other hand, salaries and wages have increased at high rates in real terms for the period 1990-1994. Wages of workers in the public sector have increased by a factor of 2.04, whereas in the private sector they increased by 1.5. During this period, policies were implemented for improving income distribution, and the share of wage and salary-earners in the Gross Domestic Product (GDP) was raised.

The lack of sufficient housing, which is both a basic need and a very important consumption item for human well being, reflects the extent of poverty, which many socioeconomic groups experience. "Gecekonu", which is the Turkish version of squatter housing seen in every developing country, provides shelter for the urban poor and "have-nots" in and around big cities (metropolises) and invades

more and more rural (agricultural) land every day. Of the estimated total urban population of 37.8 million (that is, 60.9% of the total population) in 1995, nearly a quarter still live in gecekondu-type settlements. However, the formation of gecekondu has not been stopped due both to the scarcity of National financial resources and to rising poverty levels.

The recent crisis in the Turkish economy has narrowed the possibilities to implement policies towards increasing social welfare in general and improving income distribution and alleviating poverty in particular. Inflation is still one of the foremost important factors that deteriorate income distribution and poverty in Turkey. While abject poverty (defined as pervasive poverty below biological or nutritional standards) may not be a problem in Turkey, extensive relative poverty is, and the number of poor with less than adequate nutrition, housing, and health standards has been increasing in recent years. The social security institutions in Turkey have increasing financial problems. The imbalance between the active and passive insurers requires organizational changes. The relatively low income of the rural population is the main cause for regional and urban-rural disparities in Turkey. It is estimated that 68.7% of poor households are rural. Most of the poor are from East and Southeast Anatolia (30.3%), whereas only 1.4% is from the Aegean-Marmara Region.

As of 2001, the share of agricultural sector within total employment was 13 percent; its share within the employed manpower on the other hand, was 33 percent. An important number of those, working in the agricultural sector is working with an extremely low productivity either on their own account or as unpaid family workers. The poor does not sufficiently benefit from the increase in income stemming from economic growth. A more pro-poor growth pattern has to be realized. Social security and social aid systems have been inefficient in protecting the poor section of the population. In spite of the fact that the tax burden on the working section has been alleviated relatively by the modification of the income tax tariff, no progress could be achieved towards exempting minimum wages from taxes.

About 70% of the poor earn their living from agriculture. The Government's agricultural product subsidies and tax exemptions are insufficient to alleviate the disparities. In addition to agriculture, a large number of the poor are found in small family enterprises. Since there is no persistent long-term basis for rural development, the difference in the level of welfare between rural and urban areas is gradually increasing, and the migration of the rural population to big cities is leading to: excessive aggregation; increased unemployment; and problems with regard to settlement, housing, environment, infrastructure, transportation, education, health, and public security. The unemployment rate went up to 10.5% in 1994. Similarly, the level of underemployment reached 9.3%. In urban areas, the unemployment rate among educated young people is high, whereas the proportion of women in the labor force is low. Employment in the agricultural sector with low-productivity continues to account for over 45% of the total employment of about 20.4 million. Employment in the public sector, which makes up 40% of the total paid employment, remained the same in the period 1991-1995.

The high population growth rate, which now stands at over 2% per year; and the high maternal and infant mortality rate call for further investments in National population policies. According to National statistics, 93% of the total population is covered by National social security schemes. Private social security schemes have been encouraged to expand these services to the whole population. The total population of Turkey reached 67.844.903 according to the results of General Population Census by the year 2000. The annual population growth fell to 1.78 5%. Average size of household is 4.3. Healthy birth rate is 76%; crude death rate is 0.7%; infant mortality rate is 42.7%; and child mortality rate 9.8%. The death rate under the age of five years old is 52.1%. Life expectancy at birth is for males 65.9 years and for females 70.5 years. The total life expectancy is 68.2 years for the year 1996.

It is well known that land is a very limited resource and sixty-three percent of Turkey is affected by soil erosion. In addition, 92% of the total land area and 95% of the total population are under the risk of

medium to high-level seismic movements. In Turkey the land component has the largest share in the total cost of housing at the level of 30-40%, and it is an approved fact that the only way of constructing houses at low costs can be achieved by reducing the cost of land. Recent earthquakes have also showed that there are some inefficiency in our construction and planning mechanism. Especially, there were many losses on Marmara and Düzce earthquakes in 1990. A professional insurance system is also lacking. Therefore, a new building and construction supervision system has been created in this context in 2000, with a view to ensure safety of construction works and buildings throughout the country.

The ever-increasing population living in cities and the urban-rural disparity has become the top priority issues in Turkey. Due to their financial dependency on the central government and legislation limiting their capacity in decision-making, the local authorities in Turkey are unable to provide these services at the required level.

*Ecosystem:* Turkey has 77 million ha of surface area, and of this 20 million ha are located in arid and 31 million ha are located in semi-arid climatic regions. In addition, more than 75% of the land is prone to different levels of erosion. In Turkey, some 109,124 km are deserts, and some 374,441 km are in danger of desertification. These areas are usually inhabited. The impacts of desertification on humans include, for example, illnesses of the respiratory system as well as unemployment because the agricultural land has become useless. Desertification in Turkey is mainly caused by: improper land-use; excessive grazing and fuel wood; and plant collection. Moderate impacts result from improper farming and natural causes such as wind erosion and flooding. Taking into account huge areas affected by soil erosion, more preventive measures and additional financial resources are needed. The Ministry of Forestry started erosion control and anti-desertification activities in 1955. To date, the major activities which have been implemented include: reforestation of 2.5 million ha; erosion control on 284,000 ha; and range improvement for 80,000 ha. Currently, the annual programme is 50,000 ha for reforestation and 25,000 ha for erosion control. However, the number of professional staff responsible for desertification issues is not adequate at all levels of decision-making.

According to the current forest inventories and forest management plans (1973-1999), Turkey's forest areas is 20.7 million hectares, which corresponds about 26 percent of Turkey's land area. But only half of the existing forests are classified as normal (productive) forest and the other half as degraded or severely degraded forest at present. The greatest part of forestland lies within mountain ecosystems in Turkey. Nearly all forestry activities are subject to the management of mountain development. The main problems of mountain areas are: unplanned settlements; some illegal curing; over-grazing; forest fires; and in some regions, damage caused by insects. Unique, typically representative, and/or threatened forest ecosystems within mountainous areas have been established under different protected area categories. Such protected ecosystems are taken into account in forest management plans and no silvicultural intervention is allowed.

*Water resources:* Overall, Turkey has extensive water resources, which are unevenly distributed, throughout the country. Mean annual precipitation is about 643 mm (or 501 billion cubic meters), of which 55 Percent is lost to evapotranspiration. The mean annual surface run-off of Turkey's 26 river basins is 186 billion cubic meters, of which half is considered technically and economically exploitable. More than half the surface flow originates from six major river basins: the Dicle (Tigris); Fýrat (Euphrates); Eastern and Western Black Sea; Antalya; and Western Mediterranean. The Fýrat (Euphrates) basin (15 Per cent of Turkey's total area) is the largest. The second largest in terms of surface flow is the Dicle (Tigris) with 22 billion cubic meters. Nine rivers flow for over 500 kilometers within Turkey. Annual discharge by Turkish rivers is approximately 41 billion cubic meters to the Black Sea and 36 billion cubic meters to the Mediterranean. Some 200 natural lakes (of which 50 have an area greater than 5 km<sup>2</sup>) occupy almost 1 million hectares, or 1 Per cent of the country's total area. Lake Van in Eastern Anatolia (374 000) and Lake Tuz in Central Anatolia (128 000 hectares) are the largest. There are about 250 wetlands.

Total annual aquifer recharge is 41 billion cubic meters, of which 12 million is estimated to be technically and economically exploitable. Eight billion cubic meters is currently exploited (55 Per cent for irrigation, 45 Per cent for drinking water and industrial purposes). A quarter of available groundwater reserves is found in the Fýrat (Euphrates) and the Sakarya river basins. On the other hand, major sources of pollution are domestic and industrial wastewater discharges and agricultural run off. Approximately 70% of the population is adequately served, while 7% of the population has no continuous supply.

Erosion is among the worst problem having impacts also on rivers and lakes. The Electricity Survey Administration (EIEI) has estimated that 500 million tones of sediment are delivered to rivers and lakes every year, along with 9 million tones of nutrients.

Although, industrial wastewater discharge has been greatly reduced, pollution from Small and Medium Sized Enterprises (SMEs) is still an important source of concern. Further progress is highly dependent on the availability of state funding for sewerage and wastewater treatment, taking into account the rapidly growing pollution load.

Construction of sewerage system and treatment plans for municipal wastewater shall be processed at a rate.

Supply of clean water and safe sanitation is now available to most of the population although regional and urban-rural disparities still exists in the country of 67 million population.

**Capacity-Building, Education, Training and Awareness-Raising:** The Education and Publication Department of the Ministry of Environment and Forestry, which are responsible for education on sustainable development, are preparing a National Strategy on Education.

**Information:** Turkey has carried out inventories of existing databases relevant to sustainable development. Information on water resources (withdrawals and use, restitution and discharge, quality and treatment) is regularly collected and available. The Ministry of Environment and Forestry is planning to cooperate with the State Planning Organization and the State Institute of Statistics to integrate environment and development information in the near future.

**Research and Technologies:** No information available.

**Financing:** Sewerage systems began to be designed and constructed in the late 1960s in provinces supplied with potable water under the leadership of the General Directorate of Bank of Provinces. Over 250 municipalities, which have made sewerage project proposals, are waiting for these projects to be included in the General Directorate of Bank of Provinces' investment programme. The General Directorate of Bank of Provinces will implement around 275 drinking water projects in various parts of the country within the framework of its investment programme.

On the other hand, since 1950s, the Government has invested heavily in irrigation infrastructure. In the last decade, annual investment has averaged US\$ 500 million. Eighty percent of the initiatives come from the public sector, while private initiatives by farmers cover the rest. In the mid-1990s, 58 percent of the 2800 municipalities had a drinking water supply network served by the General Directorate of Bank of Provinces and the Ministry of Tourism. 4 percent of these municipalities had drinking water treatment facilities. Some progress has been made in privatizing municipal water supply using the build-operate-transfer (BOT) model.

For aspects related to funding from international sources, see under *Cooperation*.

**Cooperation:** Infrastructure facilities have been completed by financing from the general budget and through the World Bank loans and the bed capacity (around 65 thousand beds) has been created by the private sector. First example in Turkey for private sector participation in environmental infrastructure services is Antalya Metropolitan Municipality, receiving a World Bank loan to finance water supply and wastewater treatment investments.

Turkey ratified the Convention on Wetlands of International Importance Especially as Waterfowl Habitat in 1994.

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