Environmental Protection

Shifts in social and economic conditions within Hungary from the mid-1980s onwards, and the effects of the regime change in 1989, curbed a hitherto intense environmental deterioration and put an end to severe contamination in a number of fields. As a result of this, a decreasing environmental toll has led to the improvement in the quality of the environment.

Air Pollution

In the 1980s a huge, contiguous strip of severely polluted air stretched along the north-east–south-west industrial axis, amidst the North Hungarian and Transdanubian Mountains, enveloping the cities of Miskolc, Budapest and Veszprém to the extent that ***air pollution*** endangered the health of nearly half of Hungary's population. Due to a decrease in the emission of air pollutants, areas with extremely high levels of air pollution are now only found in small and scattered patches. Since 2000, the proportion of national territory with poor ambient air quality has fallen from 11% to 6.3%, and the share of the population affected by air pollution has dropped from 40% to 35.9%. The rate of improvement is best seen when comparing levels of sulphur dioxide emissions. In 1980 SO_2 emissions reached 1.633 million tons, whereas in 2006 only 118,000 tons were emitted, representing a 93% reduction. The emission of nitrogen oxide decreased from 238,000 tons in 1990 to 208,000 tons in 2006, mainly due to the restructuring of the power sector.

Over the period between 1980 and 2006, *emissions of particulate matter* (PM) decreased from 576,600 tons to 83,000 tons (i.e. from 54 kg to 8 kg per capita). The most severely polluted mosaics were found in the vicinities of Budapest, Miskolc, Salgótarján, Pécs and Szeged (*Figure 58*). Since the 1990s, air pollution from transport has begun to endanger settlements near motorways and major roads. *Suspended PM* poses an extensive problem in Hungary. In 2007 the highest concentrations of PM were measured in cities such as Budapest, Miskolc, Pécs, Szeged and Várpalota. High PM concentrations are mainly linked to heavy traffic, residential heating and, in some places, to local industrial production. Background concentrations of SO_2 have been considerably reduced following the trend in declining emissions. In 2007, SO_2 emission limits were being respected throughout Hungary. Background concentrations of NO_2 have been slightly reduced in recent years, however the annual average immission level were exceeded in Budapest, Miskolc and Pécs.

Ground-level ozone is a major concern throughout the country. In 2007 health protection standards were exceeded at all ozone monitoring stations; the highest exceedance rates occurred in Budapest, Dunaújváros, Kazincbarcika, Salgótarján and Tatabánya.

Ragweed pollen (Ambrosia artemisiifolia) potentially affects Hungarians who suffer from respiratory diseases or allergies. In 2004–2005 the country's ragweed cover and airborne pollen levels generally dropped, but both increased again in 2006. In 2008, the highest daily concentrations of ragweed pollen (measured in pollen grains/m^3) were registered in Nyíregyháza (1,015), followed by Szeged (976), Kecskemét (968) and Győr (957) (*Figure 59*).

With regards to climate change, the reduction in *greenhouse gas* emissions from 115.8 million tons in 1990 to 78.6 million tons in 2006 is notable (-32%). The most significant reduction took place between 1988–1992 due to the collapse of energy intensive industries and the restructuring of the Hungarian economy. Such a considerable decrease has also come about as a result of changes in the energy generation mix. To meet future climate change challenges, the

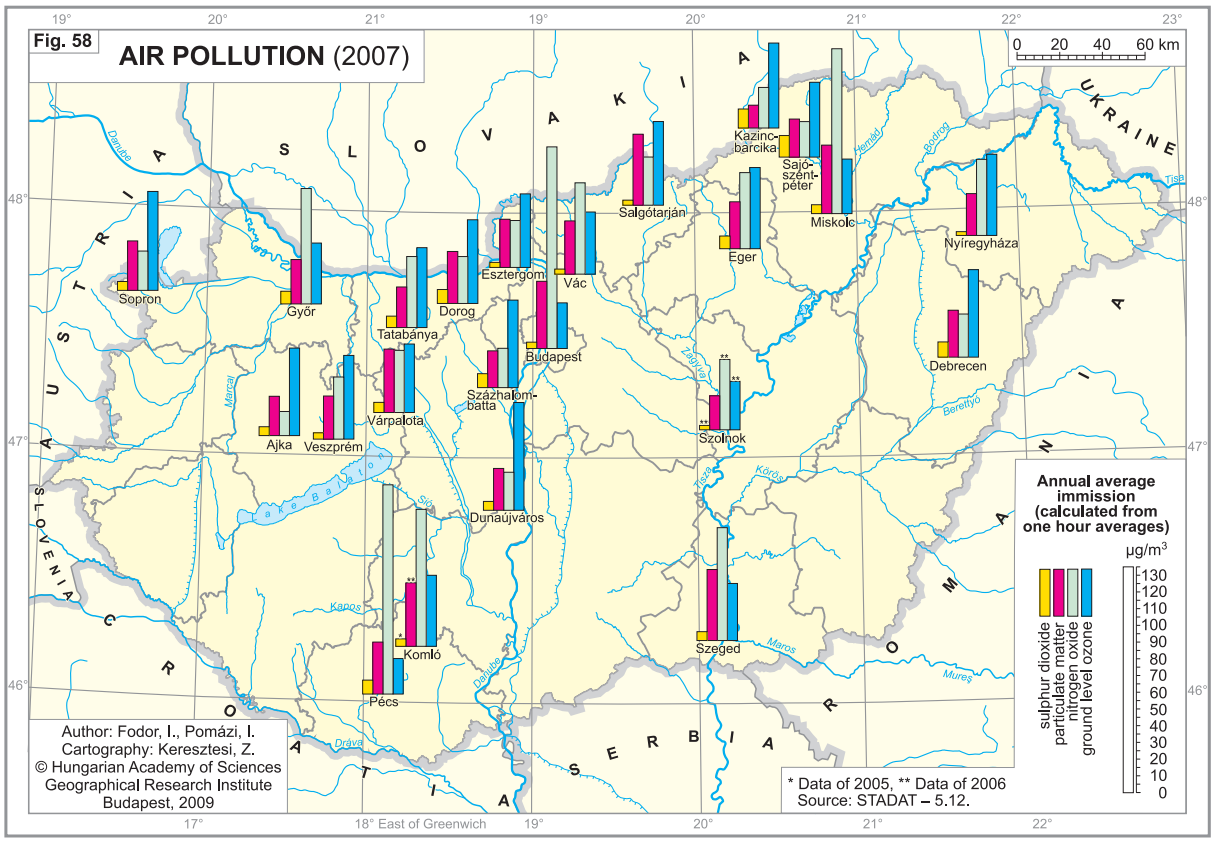
Fig. 58
AIR POLLUTION (2007)
0 20 40 60 km
Kazincbarcika
Sajószentpéter
Miskolc
Salgótarján
Eger
Nyíregyháza
Sopron
Győr
Esztergom
Vác
Dorog
Tatabánya
Budapest
Százhalombatta
Debrecen
Ajka
Veszprém
Várpalota
Szolnok
Dunaújváros
Komló
Szeged
Pécs
Annual average immission (calculated from one hour averages)
µg/m³
sulphur dioxide
particulate matter
nitrogen oxide
ground level ozone
130
120
110
100
90
80
70
60
50
40
30
20
10
0
* Data of 2005, ** Data of 2006
Source: STADAT – 5.12.
Author: Fodor, I., Pomázi, I.
Cartography: Keresztesi, Z.
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SLOVAKIA
UKRAINE
AUSTRIA
SLOVENIA
CROATIA
SERBIA
ROMANIA
Danube
Tisza
Drava
Mura
Lake Balaton

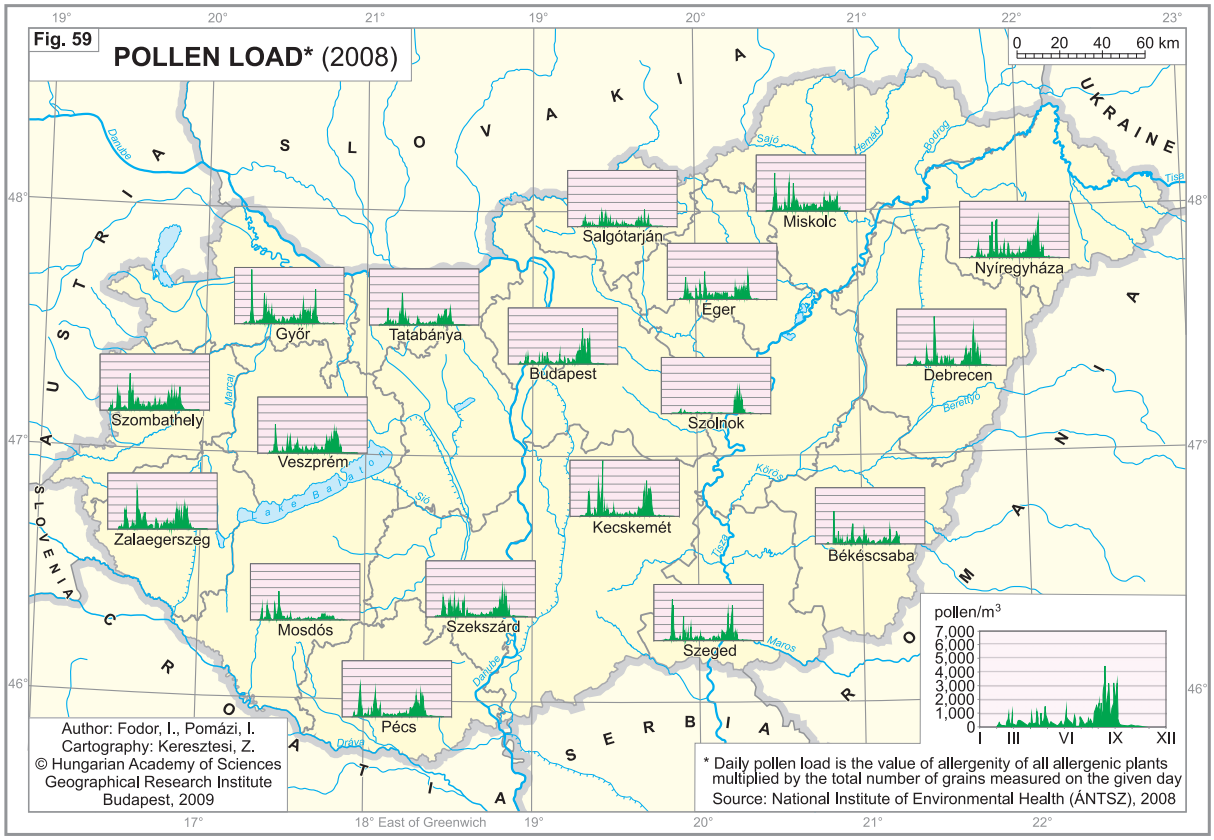
Fig. 59
POLLEN LOAD* (2008)
0 20 40 60 km
Salgótarján
Miskolc
Nyíregyháza
Eger
Győr
Tatabánya
Budapest
Debrecen
Szombathely
Szolnok
Veszprém
Zalaegerszeg
Kecskemét
Békéscsaba
Mosdós
Szekszárd
Szeged
Pécs
pollen/m³
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
I III VI IX XII
* Daily pollen load is the value of allergenity of all allergenic plants multiplied by the total number of grains measured on the given day
Source: National Institute of Environmental Health (ÁNTSZ), 2008
Author: Fodor, I., Pomázi, I.
Cartography: Keresztesi, Z.
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SLOVAKIA
UKRAINE
AUSTRIA
SLOVENIA
CROATIA
SERBIA
ROMANIA
Danube
Tisza
Drava
Mura
Lake Balaton

Hungarian Parliament unanimously adopted the National Climate Change Strategy in March 2008. Prior to 1990 seventeen coal-fired thermal power stations were in operation, whereas by 2008 only one remained that was exclusively coal-fired. Currently there are ten mixed-fuel power plants (using mostly natural gas, biomass and coal), four that operate on natural gas and oil, whilst two power plants were permanently decommissioned. Between 1998 and 2006, state expenditure for the purposes of landscape rehabilitation amounted to HUF 20.52 billion (approximately EUR 8 million at current exchange rates), in the wake of terminating uranium ore mining in the Mecsek Mountains. The funding primarily covered tasks related to pollution abatement and clean-up of the site.

The quality of the natural environment suffered severely as a result of the *activities of the armed forces* prior to 1989. The former Soviet Army had completed their gradual withdrawal from military bases in Hungary by 1991. After their departure, 171 registered and abandoned military objects remained in the country and Hungary spent around HUF 5 billion on pollution abatement, site clean-up and landscape rehabilitation in the period 1994–2006.

Water Pollution

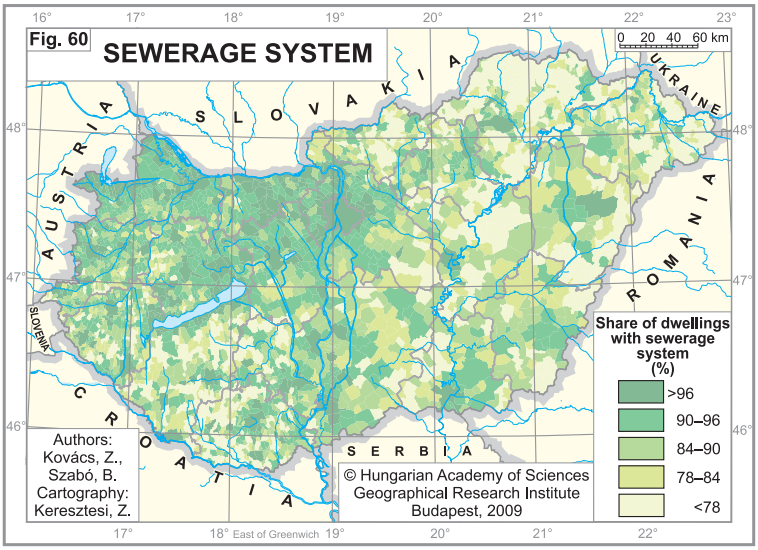
About 95% of Hungary's surface waters originate abroad and its borders are crossed by 24 incoming rivers, which bring 114 km^3 of water annually. The risk of surface water pollution is still grave and widespread, especially by nutrients and hazardous substances. The Danube generally has good water quality with regard to chemical pollutants, whereas the Tisza is contaminated by mercury and zinc. Bacterial contamination still prevails in large rivers (e.g. Danube and Tisza).

Some 60% of the Danube and 90% of the Tisza are accorded 'quality class IV' (polluted) for microbiological parameters and about 80% of the Tisza's length is accorded qualities IV and V (extremely polluted) for micro-pollutants.

Groundwater accounts for only 16% of total water abstractions, but it provides almost the entire drinking water supply of the country (40% is bank-filtered, about 10% is shallow groundwater and the rest is held in deep aquifers). Shallow groundwater is mostly affected by nitrates originating from agriculture and untreated municipal waste water.

A national river basin management plan is being prepared, in order to implement the EU Water Framework Directive. Hungary is a country prone to inundation and with the largest flood protection system in Europe (more than 4,200 km). In the last decade the country has taken significant steps towards reducing its vulnerability to flood hazards, including the preparation of flood prevention and mitigation plans, and the revision of land use planning and local construction regulations.

Despite the progress made in extending the water supply and improving purification technology, 23% of drinking water (supplying 900 settlements with 2.5 million inhabitants) does not comply with EU standards for ammo-



nium, arsenic, nitrite, fluoride, boron, iron and manganese content. The volume of municipal liquid waste produced in settlements without sewerage systems totals 100 million m^3 annually. Approximately 95% of this seeps into the soil from poorly or incorrectly constructed septic tanks. Statistics reported 4.69 million m^3 of collected ***municipal liquid waste*** in 2007. The regional distribution in the volumes of municipal liquid waste can be explained by the widening gap between the availability of piped drinking water and of a sewerage system, over the period 1945–1995. The drinking water network was completed by the mid-1990s: by 2007, 94.7% of dwellings were being supplied by piped water and 69.8% of them were connected to the sewerage network. The amount of municipal liquid waste decreased during the period 1990–2007 with the extension of the sewerage system, yet certain spatial disparities continue to exist (*Figure 60).*

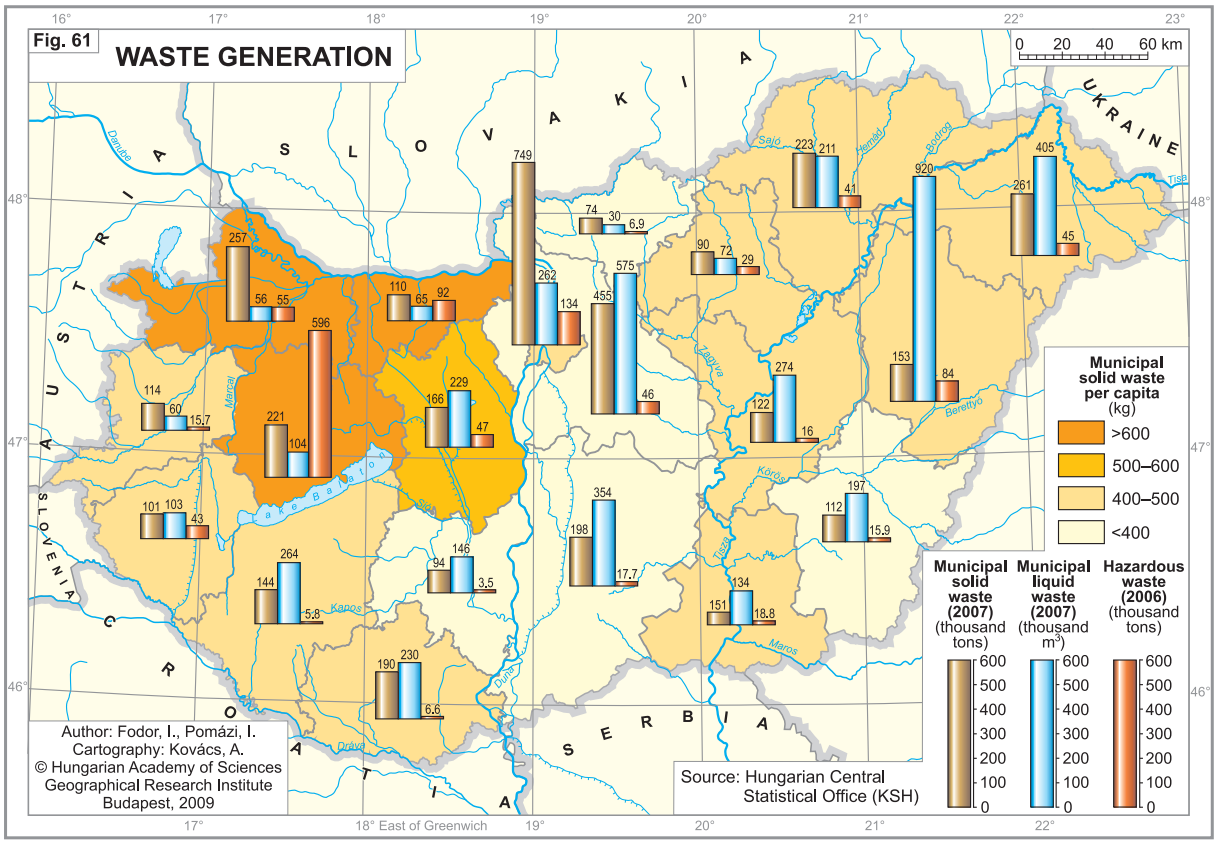
Waste Management

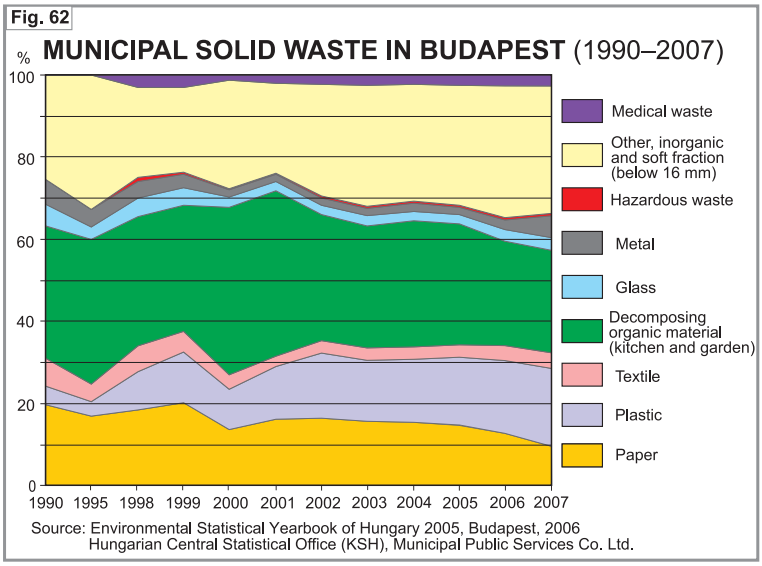
Waste management bears a special significance as far as the quality of the environment is concerned and in 1990 Hungary inherited severe problems in this field as well. The amount of waste being produced by industry and municipalities has been steadily decreasing since the 1980s. In 1990 this amount was 106 million tons, deposited in approximately 2,700 legal landfills. There are not even estimates available as to the number of illegal dumps. Due to economic restructuring, the total quantity of waste had reduced to 90 million tons by 1995, and further reduced to 68.7 million tons in 2000.

Industrial and commercial waste includes the waste material of various technologies and their by-products. Before 1989 the annual amount of waste from production activities reached 100 million tons. By 1992 production waste totalled a yearly 80 million tons, and by 1994 it had reduced to two thirds of the 1989 quantity. Approximately 500 million tons of industrial waste (99% deriving from mining, iron ore smelting, steel manufacturing, electricity production, and construction) has been deposited in old landfills. These have been shut and are today mostly reclaimed. An estimated 7% of the waste deposited in landfills qualifies as hazardous, and 90% of it is red mud from alumina extraction, whereas the remaining 10% is drilling mud.

Present-day waste management is regulated by the Waste Management Act of 2000. The National Waste Management Plan (2003–2008) sought to minimise the generation of waste, including hazardous waste. These days of a total of 26.6 million tons of waste material, municipal waste accounts for 4.7 million tons and there is 1.36 million tons of hazardous waste. Industrial and commercial waste amounts to 20.5 million tons, and is properly treated.

The amount of collected ***municipal solid waste*** increased by 188% in the period 1990–2007 (200.9 kg/person in 1990, rising to 466.9 kg/person in 2007) yet there are significant regional differences behind this data (*Figure 61)*. The increase can be attributed to economic restructuring, changes in the standard of living and consumer habits, as well as to the fact that most settlements (except for major cities) did not have organised refuse collection before 1990. The annual per capita amount of collected municipal solid waste is especially high (over 600 kg/person) in the counties of Komárom-Esztergom, Veszprém and Győr-Moson-Sopron. Such high quantities occur for a variety of reasons including changing consumer habits, and thanks to different heating systems, since central or gas heating does not facilitate the burning of otherwise combustible waste. In small settlements, however, municipal solid waste is handled locally, which is reflected in the low quantities for Békés or Bács-Kiskun counties. The composition of municipal solid waste in Budapest is shown in *Figure 62*. Analyses show that the nationwide constituents of waste largely mirror that of Budapest. In 2007 decomposing organic matter was the highest proportion of communal solid waste (24.5%), followed by plastics (18.3%) and paper (6.5%). Metal and glass represent the low-





est percentages. The total amount of recycled material maintains these proportions. In order to facilitate selective waste collection 4,000 recycling collection points and 74 waste collection yards are available in 500 settlements.

The quantity of ***hazardous waste*** has been gradually decreasing since the early 1990s due to industrial restructuring. The aluminium industry, one of the major sources of such waste, has dwindled significantly, thus the quantity of red mud as its residue has decreased too. Hazardous waste output has diminished by 49% in the period 1996–2006. The most significant decrease occurred in South Transdanubia, as the amount of hazardous waste per person was nearly 30 times less in 2006 than in 1996. Major causes of the decrease include the closure of excessively polluting, large-scale industrial works, e.g. uranium mines and enrichment facilities, coal mines, tanneries, shoe factories and other chemical plants. Low values are typical of the Somogy and Tolna counties for similar reasons. The impact of industrial restructuring has resulted in an identically significant decrease in the counties of Komárom-Esztergom and Győr-Moson-Sopron. Obsolete and outdated technologies were replaced with new manufacturing plants. In contrast, the amount of hazardous waste has largely increased in Hajdú-Bihar County with the expansion of the pharmaceutical works. Out of all the counties, it is Veszprém, with its outdated industry that was responsible for the

largest amount of hazardous waste after 2006. Hazardous waste produced in 1997 barely reached 23% of the 1990 levels.

In Hungary, only the nuclear power station at Paks uses nuclear fuel for electricity generation. Annually 58.6 tons of spent nuclear fuel elements are produced here, along with approximately 100 m^3 of solid and 250 m^3 of liquid waste of low and intermediate levels of radioactivity. These hazardous waste materials are professionally treated (in hazardous waste incinerators, chemically safe waste dumps and temporary containers). In 1999, about 950 kg of chemicals per capita were produced in Hungary, one third of which was toxic. By 2006 the total quantity produced had increased by 15% while that of toxic chemicals grew by one third.

Environmental Conflicts and Policy

The most serious ***environmental conflicts*** in the period 2000–2009 gained publicity from the campaigns of environmental activists and mass media, as they ran counter to the interests of environmental protection, and this is something in which civil society has played a significant role. Among transboundary conflicts, the cyanide pollution of the Someş (Szamos) and Tisza rivers in Romania (by the gold mine in Baia Mare/ Nagybánya) in January 2000, and the heavy metal pollution of the same rivers in March of the same year, this time on the Hungarian section, count amongst the worst ever ecological disasters in Europe. According to measurements, ca. 105–110 tons of cyanide were released into the Someş (Szamos) and Tisza, and all living organisms were affected as a result; the estimated amount of fishstock lost reached 1,241 tons on the Hungarian sections of the two rivers.

A chronic conflict has remained outstanding for twenty years between Hungary and Slovakia, over the issue of the hydroelectric power plant built at Gabčíkovo (Bős), and the cancellation of Hungary's participation in the project at Nagymaros (Danube Bend). The operation of the Slovakian nuclear power plant at Mochovce (Mohi), and illegal waste transportation and dumping has aroused further concern. Other issues include the illegal disposal of hazardous waste originating from Germany in the Kiskunság National Park, pollution of the River Rába (Raab) from Austria, the planning of a waste incinerator by an Austrian corporation near the Hungarian border at Heiligenkreuz (Rábakeresztúr) in Burgenland, and the opening of a gold mine in Roşia Montană (Verespatak) in Transylvania. The problems of environmental protection are further exacerbated by the large number of domestic issues, the solution of which is mainly the responsibility of the regional environmental authorities and local government.

At present Hungarian ***environmental policy*** is based on the Environmental Act of 1995 and the 2nd National Environmental Programme (NEP) for the period 2003–2008, along with the 3rd NEP (2009–2014) to be adopted by the Parliament by the end 2009. The present political agenda is dominated by budgetary consolidation, short-term crisis management and economic convergence with the EU. The Hungarian National Sustainable Development Strategy, adopted by the Government in 2007, provides a long term vision for 2050. In 2008, two important institutions were established by Parliament to enhance the concept of sustainable development and environmental democracy: the National Sustainable Development Council and the Parliamentary Commissioner for Future Generations (acting as ombudsman).