WATER AND HEALTH IN HUNGARY

Report to the 3rd Meeting of the Parties

PART ONE

1. Provide brief information on the process of target-setting in your country, e.g. which public authority(ies) took the leadership and coordinating role, which public authorities were involved, how coordination was ensured, which existing national and international strategies and legislations were taken into account, how cost-benefit analysis of target sets was performed.

Hungary ratified the Protocol on Water and Health in 2001, and it came into force by the Government Decree 213/2005 (X. 5.) in October 2005. Implementation of the Protocol began in 2007, coordinated by the Minister of Health and the Minister of Environment and Water. In 2010, the new Government of National Cooperation established major alterations in the government structure and the legal framework, which affected the implementation of the Protocol.

The areas covered by the Protocol are shared - on the national level - between the Minister of Human Resources, the Minister of Administration and Justice, the Minister of National Development, the Minister of Rural Development and the Ministry of Interior. The ministers act through the ministries (legal framework) and their national and regional institutional system (implementation). The health related aspects of the Protocol on the local level belong to the National Public Health and Medical Officer's Service, which was previously (until 2010) under the Ministry of Human Resources. After the governmental reorganization, the national institutions of the Service (National Institute for Environmental Health, National Centre for Epidemiology) remained at the Ministry, while the regional infrastructure was integrated into the capitol and county government offices as public health professional administrative bodies, at the level of districts (capitol districts) they operate as district-level public health institutes. Functional operation is directed by the Ministry of Administration and Justice while professional leadership is effectuated by the Office of the Chief Medical Officer.

Environmental aspects of water management are under dual leadership: strategic planning, policy making, coordination of integrated water catchment management, supervision of the water utility programmes and international cooperation belong to the Ministry of Rural Development, while the Water Directorates are under the Ministry of Interior. The water utility companies (infrastructure, drinking water supply and sanitation) are regulated by the Hungarian Energy Office (www.eh.gov.hu), which received an independent regulatory mandate effective April 2013. The former governmental water research institute, VITUKI was dissolved in April 2012. Simultaneously, a financially and operationally independent government research institute, the National Environmental Institute (NEKI) was established, providing technical support to the Ministry of Rural Development. Areas of expertise include environmental status assessment, monitoring, policy and strategy planning, and effect-based assessment (www.neki.gov.hu).

The network of Environmental, Natural Protection and Water Inspectorates consisting of one national and ten regional offices under the Ministry of Rural Development act as the water authority on the local scale. The Inspectorates are involved in the authorization and official supervision of environment usage and environmental monitoring.

As of January 1st, 2012, the Ministry of Interior coordinates the operative water management, especially flood and inland inundation protective measures. The National Water Directorate coordinates on the national level, and 12 regional water directorates act locally.

Hungary, as a member state of the European Union is under obligation to implement the „acquis communautaire", including areas related to the Protocol. The EU obligations generally assist progress towards to the Protocol goals, moreover, financial difficulties largely limit the effort to these areas. Examples include the National Sanitation and Wastewater Treatment Programme, the Drinking Water Quality Improvement Programme, and the River Basin Management Planning (the latter is an obligation under the Water Framework Directive). In spite of the economic crisis and financial difficulties, significant progress was achieved in safeguarding water sources and the remediation of contaminated sites. The above task areas were also targeted by national operative programmes of the Government.

Hungary held the EU Presidency for the first time in the first 6 months of 2011. Main priority of the Presidency in environmental protection was sustainable water management and the protection of water resources. International cooperation in water management on local, regional, and pan-European scale was a key issue. Hungary aimed to promote the ratification of the Protocol in other EU member states. Hungary also invited the European Commission to consider inclusion of the Protocol into the EU regulatory framework.

Hungary actively participated in the organization of water related events in 2012 adjoining the Rio+20 Conference. Consecutively, Hungary organizes the Budapest Water Summit on water and sanitation in October 2013.

Development of the National Water Strategy began in 2012 and was still in progress during the preparation of the present report. Aim of the Strategy is the protection of water (both quality and quantity), management of water uses (drinking water abstraction, industrial and agricultural use, ecological water demand, etc.) prevention or minimization of unwanted effects of water abundance or scarcity. The Strategy aims to increase state involvement in water utility property management, water supply and sanitation services and development of the water treatment plants.

Implementation of the Protocol in Hungary was previously coordinated by the Water and Health Expert Committee. However, official mandate of the Expert Committee was discontinued when the appointing Inter-ministerial Committee on Public Health was dissolved through a government decision.

Members of the former Expert Committee continued cooperation in a voluntary form. Working relations and personal, phone or email communication concerning tasks related to Protocol implementation were maintained between the parties, however, in the absence of an official mandate since 2010, revision of targets and target dates set under Article 6 (2) of the Protocol was not carried out prior to preparation of the present report. During the drafting period, targets and progress toward the implementation of the targets were assessed. In the next phase, target dates will be revised and new or revised targets will be proposed to the Government.

Government reorganization – outlined above – brought new parties (such as the Ministry of Interior, Ministry of Administration and Justice) into the coordination procedure. The meetings with the new stakeholders were generally convened for specific purposes regarding the implementation of government programmes, policy-making or other inter-ministerial tasks, and Protocol implementation was not among the declared goals. However, progress towards the implementation of the Protocol is inevitable in many areas. Legal EU obligation is still a main driving force; most improvement is seen in areas where the Protocol targets and EU requirements overlap.

2. What has been done in your country to ensure public participation in the process of target-setting and how was the outcome of public participation taken into account in the final targets set?

Hungary, as a party to the Aarhus Convention and an EU member state is obliged to ensure public participation in environment protection actions and the Protocol target setting procedure.

On a local level, input from the public has an influential role in decisions for instance on wastewater deposition and treatment development. Involvement of the local community is also very important in drinking water quality improvement programmes if the public has sufficient information on the importance of the development.

Access to information is a critical part of public involvement. The ministries and their institution provide extensive information through their websites, including materials related to various areas of the Protocol. The National Environmental Information System is a framework for surface water, groundwater and waste databases (okir.kvvm.hu). It is still under development from national and EU funding.

Community level drinking water quality is available in an interactive searchable map format, and a yearly national and regional summary is also published on the National Institute for Environmental Health website (oki.antsz.hu).

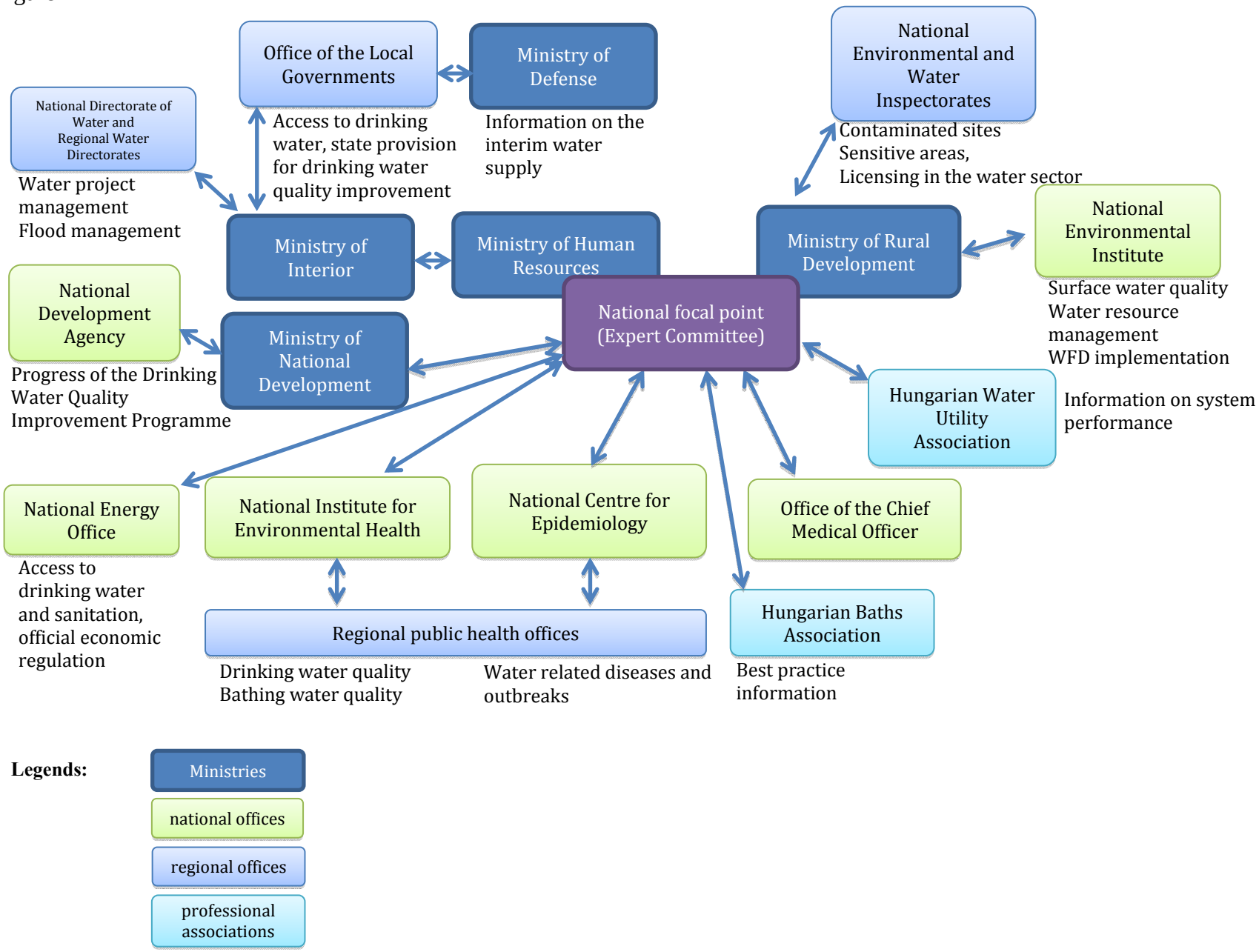
Ecological status of the large lakes is posted on www.kvvm.hu/szakmai/balaton webpage. On-line information is available at www.rivermonitoring.hu from the automatic measuring points on Upper-Tisza, which is one of the surface water bodies most liable to contamination. Natural bathing water quality of the designated beaches is accessible in a list format (http://www.antsz.hu/portal/portal/furdoviz1.html.) or as an interactive map (oki.antsz.hu).

The EPER and E-PRTR databases contain the discharge and emission data from facilities with the largest environmental burden. The databases are available not only from national portals, but through EU public databases as well (pl. http://eper.ec.europa.eu/eper/; http://eper-prtr.kvvm.hu/; http://prtr.ec.europa.eu; http://okir.kvvm.hu/prtr/). The web pages are continuously updated and improved.

The dedicated webpage of the Hungarian implementation of the Protocol on the National Institute for Environmental Health (viz.wesper.hu) provides a public platform to receive information and share views on targets and the implementation procedures.

Active involvement of professional associations is a significant input in target setting and implementation. The Hungarian Baths Association had a leading role in the development of best practice guidance and technical standards for pool operators, and is an important partner in the preparatory work for policy making. The Hungarian Water Utility Association, the professional network of water utility operators has similar input through its working groups to target setting in areas related to their mission, and drafting of the policy background for implementation.

Figure 1


Office of the Local Governments
Ministry of Defense
National Environmental and Water Inspectorates
National Directorate of Water and Regional Water Directorates
Access to drinking water, state provision for drinking water quality improvement
Information on the interim water supply
Contaminated sites
Sensitive areas,
Licensing in the water sector
Water project management
Flood management
Ministry of Interior
Ministry of Human Resources
Ministry of Rural Development
National Environmental Institute
National Development Agency
Ministry of National Development
National focal point (Expert Committee)
Surface water quality
Water resource management
WFD implementation
Progress of the Drinking Water Quality Improvement Programme
Hungarian Water Utility Association
Information on system performance
National Energy Office
National Institute for Environmental Health
National Centre for Epidemiology
Office of the Chief Medical Officer
Access to drinking water and sanitation, official economic regulation
Regional public health offices
Hungarian Baths Association
Drinking water quality
Bathing water quality
Water related diseases and outbreaks
Best practice information
Legends:
Ministries
national offices
regional offices
professional associations

3. Provide information on the process by which this report has been prepared, including information on which public authorities had the main responsibilities, which other stakeholders were involved, etc.

Drafting of the report was initiated by the former chair of the Expert Committee (director of the National Institute for Environmental Health) who was previously responsible for the coordination and finalization of the reporting. The Expert Committee informed the involved ministries and NGOs on the reporting obligation, reporting areas and deadlines. Chapters of the report were drafted by the ministry responsible for health (Ministry of Human Resources), the ministry responsible for water and environment (Ministry of Rural Development) and their background institutions, with inputs of various extent from other ministries and NGOs.

The national focal point prepared a template and instructions for reporting, which was distributed to the ministries and other contributors. The ministries requested the necessary data and information from their national and regional institutional network to assess target implementation. The Ministry of Rural Development coordinated reporting on drinking water and other water resource management, water utilities, protection of surface water and groundwater, and remediation of contaminated sites with contributions from the National Environmental Institute, regional Environmental and Water Inspectorates, and the Ministry of Interior. The lead coordinator National Institute for Environmental Health under the Ministry of Human Resources directly communicated with the Ministry of National Development, the Hungarian Energy Office, the National Centre for Epidemiology, the Hungarian Water Utility Association and the Hungarian Baths Association (Figure 1).

4. Report any particular circumstances that are relevant for understanding the report, e.g. whether there is a federal and/or decentralized decision-making structure, or whether financial constraints are a significant obstacle to implementation (if applicable).

The Government Decree declaring the ratification of the Protocol appointed the Minister of Health and the Minister of Environment and Water jointly for the implementation of the Protocol. Following multiple reorganizations, the tasks were delegated to new ministries with new structure and responsibilities (Ministry of Rural Development replaced the Ministry of Environment and Water, and the Ministry of Health was integrated into the Ministry of National Resources, renamed in 2012 the Ministry of Human Resources. As it was outlined in Section 1, certain national and regional institutions responsible for actions in the implementation process were transferred to other ministries: regional public health offices to the Ministry of Administration and Justice, some central and regional institutions in water management to the Ministry of Interior, while the control of water utilities to the Hungarian Energy Office. The new, more complex responsibility network – for the transitional period – slows down the flow of information and the coordination of target setting.

In the end of 2011 (Dec 30th) the Parliament accepted the long-awaited Water Utility Act CCIX/2012 (hereinafter: WUA), which after 25 years revised the legal framework of water supply and sanitation services. The WUA brought major changes in many areas of Protocol implementation as referenced in the appropriate sections of the present report and it mandated the Government to set the detailed regulatory framework through a Government Decree. The implementing Decree (58/2013 (II.27)) was delayed for over a year and came into force only on March 1st, 2013, which hindered the implementation of many actions bearing significance to the Protocol as well.

5. Please describe whether and, if so, how emerging issues relevant to water and health, (e.g. climate change) were taken into account in the process of target-setting.

Hungary is highly sensitive to climate change. Climate models for the 21st century project the continuation of the warming trend observed in the previous decade in the Carpathian basin. Most models agree that between 2021 and 2050 the yearly cumulated precipitation will not change significantly. However, a very unfavourable decrease of at least 5-10 % in the summer precipitation is projected. The number of consecutive dry days in summer is expected to increase; longer dry periods are likely already in the near future. In contrast to the summer draught, heavy rain days (precipitation over 20 mm/day) are foreseen to become more frequent in the other seasons. Changes in the precipitation trends will directly influence water management in Hungary.

Increase in extreme weather days will lead to more frequent extreme hydrology events (flood, flash flood, inland inundation, draught and water scarcity), which might influence even the provision of safe water for drinking, agriculture (food production) and floods may poise direct life hazard and epidemiological risk on the flooded areas.

The Climate and Energy State Secretariat under the Ministry of National Development is responsible for the development of a national green economy strategy (including a climate strategy) and the general augmentation of the sector. The National Water Strategy is being developed in parallel with the drafting of the present report (with a deadline of June 30, 2013); it is currently under wide public hearing. Action plan will be outlined after the finalization of the Water Strategy.

PART TWO: COMMON INDICATORS

Common indicators related to drinking water and sanitation services are shown using 2008 values (as baseline data) and the last accessible full data year, 2010 (Table 1, Table 2). Where available, e.g. drinking water quality and disease rates, 2012 data was used to show progress, and 2005 and/or 2008 as the baseline.

I. DRINKING WATER QUALITY

Drinking water quality and monitoring in Hungary is regulated by Government Decree 201/2001. (X. 25.) implementing the EU Drinking Water Directive (98/83/EC, DWD). For some chemical parameters (arsenic, boron and fluoride), temporary (higher) limit values applied until the end of 2012, due to the derogation granted by the European Commission. In the present report, assessments are based on the WHO guide values (which is for the above parameters identical to the DWD limit values).

An important achievement in the past 3 years related to the drinking water quality – besides the full or partial completion of some qualitative and quantitative targets detailed below - was the reorganization of the data collection and assessment system. The regional public health offices, responsible for the compilation and delivery of the drinking water quality data, achieved almost 100 % efficiency in this task, though the delivery is still often considerably delayed. Data collection and compilation are performed using dedicated software in every county, though data safety and validation are still challenging. Central data analysis now based on a solid expertise and statistical background, and uses only fully validated data. The analysis is used fulfil national and international obligations on reporting and information to the public. The new system enabled the assembly of the first community-level, detailed, risk-based assessment of drinking water quality in 2011. Result of the assessment was made publicly available on the website of the National Institute for Environmental Health in an interactive map format. The new reporting system allows for fasted data processing, enabling the use of 2012 values for the current report. The values are based on 3280 water supply zones and population of 9,957,731 reported for 2012.

Table 1

Indicators of the faecal contamination of the drinking water
(% non-compliance)

Parameter	2005	2008	2012
E. coli	1.13	1.10	0.58
Enterococci	3.29	2.50	1.65

Faecal indicator non-compliance is one of the basic indicators of drinking water quality. However, it is not suitable for more detailed characterization. More complex indicators are shown in Part 3 (Table 12). Decrease in *E. coli* and *Enterococcus* non-compliance do not necessarily reflects the actual changes in drinking water quality, it might relate to the data quality improvement after the revision of the reporting system. However, there is a visible positive trend in microbial non-compliance. Numeric target was not set to date.

Table 2

Indicators of the chemical contamination of the drinking water
(% non-compliance)

Parameter	2005	2008	2012
Fluoride	0,86	0,20	0,19
Nitrate and nitrite	1,48	3,72	0,87
Arsenic	41,0	44,4	32,7
Lead	0,9	0,20	1,24
Iron	10,9	9,20	10,4
Additional chemical parameter 1: Boron	6,90	5,20	5,49
Additional chemical parameter 2: Mn	17,1	15,4	16,9
Additional chemical parameter 3: THM	1,43	1,90	1,48
Additional chemical parameter 4: Hardness (low)	7,52	7,56	6,43
Additional chemical parameter 5: Permanganate value (oxygen demand)	0,92	1,20	1,04

The number of non-compliant samples does not correspond to the number of non-compliant communities for every parameter. Some parameters – mainly those from geological sources, such as arsenic and boron – are infrequently monitored in the compliant water supply zones; even frequency as low as one sample per 5-10 years is possible. Non-compliant supply zones, on the other hand, are monitored with increased frequency. Thus the analysis number is highly distorted towards the non-compliant samples.

There was significant improvement in the water quality of many supply zones where the arsenic concentration was non-compliant. Through changes in the treatment technology, new water sources or water mixing, arsenic concentration under the limit value was achieved. Further details are described in Part 3.

Ammonium, manganese, and iron content from geological origin exceeding the limit values is still a frequent problem, but in the framework of the current Drinking Water Quality Improvement Programme improved technology will be installed in many of the affected supply zones to remove these compounds, or compliance will be achieved through other means by 2015. Occurrence of nitrite non-compliance was reduced significantly in many supply zones as the result of the Nitrite Action programme, which is in place since 2007 and involves enhanced monitoring and improving management practices.

Lead pipelines are still present in the distribution system, mostly in the domestic installations, but in some supply zones, in the service pipes as well. The extent of the problem will be revealed through a national surveillance programme to be carried out in 2013.

II. REDUCTION OF THE SCALE OF OUTBREAKS AND INCIDENTS OF WATER-RELATED DISEASE

Table 3

Indicators of water related disease incidence rates
(cases and outbreaks)

	Cases			Outbreaks		
	2005	**2008**	**2011**	**2005**	**2008**	**2011**
Cholera	0	0	0	0	0	0
Bacillary dysentery (shigellosis)	85	78	44	11	1	3
EHEC	3	2	?	0	0	0
Hepatitis A	279	168	82	13	8	5
Typhoid	3*	1*	1*	0	0	0

*Imported cases

Though the table is intended to demonstrate the number of water-borne diseases, the above cases were not connected to drinking or bathing water. Since the last report, one drinking water related outbreak was identified, where the aetiological agent was unknown.

III. ACCESS TO DRINKING WATER

Access to piped public drinking water supply has approached the maximum economically feasible level in the past few years. Further increase in the indicators reflects the number of newly built housing and holiday homes connected to the public supply, rather than increasing access. In this regard, future targets could be set in improving equitable access (underprivileged population, remote rural areas).

Table 4

Access to drinking water supply

Percentage of dwellings with access to drinking water	**2005**	**2008**	**2010**
Total	93.98 %	94.91 %	97.23 %
Urban	95.92 %	96.62 %	98.79 %
Rural	89.82 %	90.97 %	92.62 %

Population of Hungary in 2010 was 9,985,722 living in 3154 communities according to the Central Statistical Office. Access to improved water is available for 97.3 % of the population, and piped into the household for 92.5 %.

Public water supply is available in all municipalities, the number of water supply zones (including municipalities and districts with individual public water supply) is 3246.

Distribution of communities, the served population and volume of supplied water by the size of the supply zone is summarized in Table 5. There was no significant change in this regard in the past few years. The average water consumption is still significantly higher in the towns (140 l/day/person) than in the smallest communities (90 l/day/person).

Table 5

Distribution of water supplies by size

	Total	<100 m^3/day	100-400 m^3/day	400-1000 m^3/day	>5000 inhabitants*
Number of communities	3246	61,6%	27,7%	2,4%	8,5%
Population	9,703,407	9,4%	17,8%	2,7%	70,0%
Supplied water (m^3/day)	1,265,719	6,5%	13,8%	3,1%	76,5%

***** large supply zones in the DWD are either defined as supplying over 1000 m3/day water or serving more than 5000 people. For technical reasons, the latter definition was used for the current assessment, while small supply zones are separated by the supplied daily volume.

IV. ACCESS TO SANITATION

Extension of the collective sewerage system is one of the most dynamically developing areas, due to the targets corresponding to EU obligations and the financial resources provided for the fulfilment of the obligations. The 2010 targets were mostly achieved; the next target is to establish 100 % access to sanitation in the agglomerations of 2000-15000 person equivalents by Dec 31st 2015. Improvement of sanitation in agglomerations smaller than 2000 person equivalents is not under EU regulation, and numerical targets were not set in this area. However, there are still a potential for development through regional operative programmes (see Part 3 for further detail).

Table 6

Access to sanitation

Percentage of dwellings with access to improved sanitation	2005	2008	2010
Total	64,95 %	71,28 %	72,50 %
Urban	78,95 %	84,38 %	87,30 %
Rural	34,74 %	41,11 %	44,37 %

V. EFFECTIVENESS OF MANAGEMENT, PROTECTION AND USE OF FRESHWATER RESOURCES

Water quality

The assessment of new data on the quality of surface water and groundwater will be performed in 2013, after the finalization of the present report. Thus for these indicators, the latest available data is from 2010. Targets set in this area (relating to EU obligations) are unchanged: 10 % and 68 % river waters, 21 % and 69 % of lake waters, 69 % and 77 % of groundwaters should reach at least „good" status by 2015 and 2021 respectively.

Table 7

Ecological status of surface water
(% water bodies)

Percentage of surface water classified as of	Baseline value (2000)*	Intermediate value (2007) **	Current value (2010) **
High status	1 %	2 % (8 %)	0 % (6 %)
Good status	13 %	15 % (44 %)	14 % (46 %)
Moderate status	40 %	48 % (41 %)	65 % (45 %)
Poor status	33 %	29 % (7 %)	17 % (3 %)
Bad status	13 %	6 % (0 %)	4 % (0 %)
Total number of water bodies classified		670 (800)***	195 (426)****
Total number of water bodies in the country		1082	1082

* based on the Hungarian assessment method applied between 1994-2006, which took only physico-chemical parameters into consideration. The Water Framework Directive ecological assessment was introduced in 2007, thus the data from 2000 are only comparable with those in brackets for 2007

** Ecological status based on biological, hydromorphological and physical-chemical parameter; in brackets only by physico-chemical assessment

***Covering sampling period of approximately 2004-2007, based mostly on non-WFD compatible monitoring results

****Water bodies monitored in 2010. Draft, preliminary data, the WFD status assessment is still ongoing for the River Basin Management Plan-2 process.

Table 8

Chemical status of surface water
(% water bodies)

Percentage of surface water classified as	Baseline value (2007)	Current value (2010)
Good status	51%	98%
Poor status	49 %	2%
Total number of water bodies classified	59*	165**
Total number of water bodies in the country	1082	1082

** Because of the lack of monitoring data, 94,5 % of the surface water bodies were not assessed during 1st river basin management process. Data covers the sampling period of approximately 2004-2007, based mostly on non-WFD compatible monitoring results and only a limited number of parameters (heavy metals)*

*** Water bodies monitored in 2010. Draft, preliminary data, the WFD status assessment is still ongoing for the River Basin Management Plan-2 process.*

Table 9

Status of groundwaters
(% groundwater bodies)

Percentage of ground-waters classified as of	Baseline value (2007)	Current value* (2010)
Good status	85,4 % (quantity status) 79,5 % (chemical status)	85,4 % (quantity status) 79,5 % (chemical status)
Poor status	14,6 % (quantity status) 20,5 % (chemical status)	14,6 % (quantity status) 20,5 % (chemical status)

*The assessment of the groundwater status is ongoing in 2013 due to the timetable of WFD river basin management planning. Before approval of the new assessment results, the earlier status data are official.

Water use

Water exploitation index at the national and river basin levels for each sector (agriculture, industry, domestic) is mean annual abstraction of freshwater by sector divided by the mean annual total renewable freshwater resource at the country level, expressed in percentage terms.

Table 10a

Water exploitation index (surface water)

Water exploitation index (surface water)	Baseline value (2006)	Current value (2010)
Agriculture	0,24 %	0,20 %
Industry[1]	0,04 %	0,03 %
Domestic use[2]	0,20 %	0,24 %
Other uses*	0,21 %	0,21 %
Energy cooling **	3,00 %	3,14 %

1 The figure includes abstractions for manufacturing industry and for production of electricity, but does not include cooling water
2 The figure refers only to public supply
* Figure refers to services, construction, etc. (the row added to the table by Hungary)
** Figure refers to abstraction for production of energy (only cooling waters) (the row was added to the table by Hungary)

The definition of OECD (EUROSTAT/OECD Joint Questionnaire On Inland Waters) was used for the calculation of water exploitation index.

Accordingly, surface freshwater means: Water which flows over, or rests on the surface of a land mass, natural watercourses such as rivers, streams, brooks, lakes, etc., as well as artificial watercourses such as irrigation, industrial and navigation canals, drainage systems and artificial reservoirs. For purposes of these tables, drinking water abstraction by bank filtration (induced infiltration of river water through bankside gravel strata (by pumping from wells sunk into the gravel strata to create a hydraulic gradient) with the intention of improving the water quality) is included in the surface freshwater use.

Table 10b

Water exploitation index (groundwater)

Water exploitation index (groundwater*)	Baseline value (2006)	Current value (2010)
Agriculture	1,90 %	2,40 %
Industry[1]	2,10 %	1,70 %
Domestic use[2]	15,80 %	14,20 %
Other uses**	2,40 %	2,30 %
Energy cooling ***	1,80 %	1,60 %

1. The figure includes abstractions for manufacturing industry
2. The figure refers only to public supply

* See above, in this case "groundwater" does not contain bank filtration waters

** Figure refers to services, construction, etc. (the row was added to the table by Hungary)

*** Figure refers to abstraction for production of energy (only cooling waters) (the row was added to the table by Hungary)

PART THREE: TARGETS AND TARGET DATES SET AND ASSESSMENT OF PROGRESS

I. QUALITY OF THE DRINKING WATER SUPPLIED (ARTICLE 6, PARAGRAPH 2 (a))

Target:

1. To supply 96 % of the population with chemically compliant drinking water by 2015. Intermediate target: To supply 80 % of the population with chemically compliant water by 2010.

2. To reduce microbiological non-compliance in small water supplies (served population less than 5000). (Numerical target and target date was not set.)

Drinking water quality regulation in Hungary implements the 98/83/EC Drinking Water Directive (DWD). Targets are aimed towards full compliance with national and EU quality requirement in collective water supplies by 2015.

The most relevant issue of public drinking water supply in Hungary is the unfavourable chemical composition in some areas due to the geology of the water source. The most significant problem - both in its frequency and its public health impact - is the arsenic non-compliance. Reducing the arsenic (and though it affects a much smaller population, boron and fluoride) related chemical non-compliance was a long-standing national goal. An operative programme was launched in 2007, in which framework the municipalities could apply for EU funding to solve the above problems. Beside arsenic, boron and fluoride exceedance, high ammonium concentration in the source water, and the resulting high frequency non-compliance of nitrite were also potential eligibility criteria for the funding applications. The Drinking Water Quality Improvement Programme (DWQIP), which was launched in 2001, did not produce the expected magnitude of effect, even though the funds were available: by 2010, drinking water quality was improved in only a small portion of the eligible municipalities. Main reasons for the delay were the lack of the required own funds, and the low motivation of the local governments holding the responsibility for providing safe drinking water for the population. Water fees – used often as a political tool in the local politics - were feared to increase after the investments. There was also a widely accepted, and by some stakeholders even disseminated misinformation on the possible health effects of arsenic. The Government of National Cooperation took further step to enhance the efficiency of implementation in 2011. Through modifications in the policy framework and other governmental actions, the own funds were provided for the affected municipalities and the Government took responsibility for the project implementation in the communities where progress was the slowest. The Ministry of Interior established the Coordinating Office of the Local Goverments to supervise the implementation of the remaining projects and to assist in coordination. The local public health offices - in accordance with the Action Plan of and the Chief Medical Officer’s Office – contacted all involved local governments and water suppliers, and special attention was focused on solving the arsenic, boron and fluoride non-compliance of the drinking water.

As a result of the above actions, all affected municipalities applied for funding under the DWQIP by 2012 to resolve water quality problems. Thus the targets set in 2008, and modified in 2009 (to supply the 96 % of the population by chemically safe water by 2015) became more realistic. The intermediate goal (80 % of the population provided with safe water) was achieved, but later than the target date (2012 instead of 2010).

Hungary in the „acquis communitaire" applied for derogation on arsenic, boron and fluoride, which was granted until Dec 25, 2006, and after an extension, Dec 25, 2009. The approaching deadline of the derogation also contributed to the acceleration of the DWQIP. The Hungarian Government applied for further extension, and the European Committee in its Decree of May 30, 2012, granted the extension till Dec 25, 2012 and excluded the possibility of further derogation.

Until the quality improvement investments under the DWQIP are completed, safe drinking water is supplied by temporary means. According to a recent survey, concentration of arsenic was reduced to below the limit value by technology changes or temporary operator interventions in 165 municipalities (almost half of all affected supplies). Where technical solution was not possible, drinking water is temporarily supplied in bottles or from water tanker vehicles. Mobile water treatment devices are being installed in most municipalities. The Ministry of Defence has leading role in organizing the temporary water supply (provision of water tanker vehicles, manufacture and installation of the mobile treatment devices). The long-term water quality improvement investments are expected to be completed in 2013-2015, significantly reducing the disease burden of the population.

Current drinking water quality, and the recent changes – as the result of the DWQIP, the Nitrite Programme and other interventions - are not only demonstrated by the common indicators (Table 2), but additional assessments, including the number of the affected municipalities and population for 2012 are also shown, similarly to the previous report (Tables 11-13).

The calculated nitrate+nitrite common indicator is in the Hungarian context practically equivalent to the sum of the nitrate and nitrite non-compliance, as simultaneous exceedance of nitrate and nitrite seldom occurs. Nitrate non-compliance in itself is rare, thus the common indicator practically reflects the frequency of non-compliant nitrite analysis. (The reference value used for the calculation of non-compliance is the 0.5 mg/L EU limit, and not the 3 mg/L WHO guide value.) Lead non-compliance is an increasing problem as the more strict EU limit value comes into force in the end of 2013. The increase in non-compliance seen in Table 2 is the effect of more frequent monitoring, and the targeted monitoring programme initiated by the National Institute for Environmental Health, but it still does not reflect the actual status.

The number of municipalities where the arsenic, boron, fluoride, nitrite or nitrate exceeds the limit value and the affected population are shown in Table 11.

Iron or manganese non-compliance mainly affects the consumer acceptability of the water. As the iron and manganese problems are often co-occurant, the frequency of non-compliance is better reflected by the joint assessment of the parameters (iron and/or manganese, Table 12).

Another problem area of drinking water quality is the anthropogenic (primary) contamination and distribution system derived (secondary) non-compliance, which requires a more complex, multidirectional management. The best public health indicator of the above is the microbiological contamination, which is the first common indicator listed in the present report (Table 1). Table 13 show a more detailed analysis of the data for the baseline and the last finished analysis year. This includes the number of *E. coli* and *Enterococcus* analysis, percentage of non-compliance, ratio of affected municipalities, rate of severe non-compliance (over 10 % of all samples, at least two positive results), and the joint assessment of *E. coli* and/or *Enterococcus* non-compliance.

Compilation and assessment of the water quality data is based on the municipality as a unit. Thus every municipality, and the districts with individual supply are assessed as independent

water supply zones. The number of units in the database therefore exceeds the number of municipalities in Hungary.

Table 11

Number of water supply zones and the affected population with arsenic, boron, fluoride, nitrite or nitrate incompliance in 2008 and 2012*

Parameter	2008		2012.	
	No of supply zones affected	No. of population affected	No of supply zones affected	No. of population affected
Arsenic	411 (10,89%)	1.425.843 (13,88%)	363 (11,07%)	901.372 (9,05%)
Boron	49 (1,30%)	109.012 (1,06%)	45 (1,37%)	97,224 (0,98%)
Fluoride	10 (0,26%)	9394 (0,09%)	3 (0,09%)	1309 (0,01%)
Nitrite	28 (0,74%)	44281 (0,43%)	56 (1,71%)	109932 (1,10%)
Nitrate	3 (0,07%)	3915 (0,04%)	2 (0,06%)	13,083 (1,31%)

*Based on total numbers of 3774 and 3280 water supply zones and 10.270.937 and 9.957.731 total population in 2008 vs. 2012. Some of the districts in the 2008 report were identified as non-individual supplies, and omitted from the 2012 assessment.

Table 12

Number of water supply zones characterised with iron and/or manganese incompliance in 2008 and 2012*

Parameter	2008		2012	
	No of supply zones	No. of population	No of supply zones	No. of population
Iron	376 (10,3%)	458.591 (4,49%)	417 (12,71)	522.224 (5,24)
Manganese	555 (16,1%)	1.123.074 (11,2%)	611 (18,63)	1.186.692 (11,92)
Iron and/or manganese	743 (21,5%)	1.404.147 (14,0%)	781 (23,8)	1.410.370 (14,2)

*A water supply zone is assumed non-compliant, if iron and/or manganese exceed the limit value in more than a third of the measurements.

The increase of iron and/or manganese non-compliance (both on municipality and population level) is probably due to the improvement of reporting and not changes in water quality.

The number of municipalities with sporadic or recurring faecal contamination, and the affected population improved compared to the last report (2008 data), but it is still unacceptably high (Table 13).

To achieve further development, future target should focus on the improvement of water supply practices, in connection with the implementation of the above-mentioned Water Utility Act, rather than quantitative targets of water quality indicators. Targets to be set may include sustainable management, higher technical standards, and good water safety practice in the water supplies (see Common indicators and Art 6 (2) f, j, m).

Table 13

Faecal contamination of the drinking water in Hungary

Indicator		***E. coli***	***Enterococcus***	***E. coli* or Enterococcus**
NC settlements	**2008**	309 (8,36)	281 (9,14%)	499 (13,3%)
	2012	238 (7,26%)	190 (5,79%)	374 (11,5%)
settlements with ≥10% (min 2) NC	**2008**	79 (2,16%)	71 (2,31%)	150 (4,0%)
	2012	40 (1,22%)	41 (1,25%)	82 (2,51%)
Population affected in ≥10% (min. 2) NC	**2008**	98.200 (0,98%)	141.000 (1,45%)	226.700 (2,2%)
	2012	50.390 (0,51%)	95.891 (0,96%)	195.810 (1,97%)

*NC: non-compliance

II. REDUCTION OF THE SCALE OF OUTBREAKS AND INCIDENTS OF WATER-RELATED DISEASE (ARTICLE 6, PARAGRAPH 2 (b))

Target: No quantitative target has been set because of the low number of identified cases of water related communicable diseases. Our targets are related to further improvement of the effectiveness of the surveillance system. One of the targets is the development of a communicable disease patient registry that enables update on a daily basis. The completion of the target is expected in 2014. Further possible target is to improve the recognition of the water related communicable diseases.

The surveillance of communicable diseases and outbreaks is efficient: in 2011, 778 outbreaks of gastro-enteritis were registered in Hungary. Of the registered outbreaks, 293 were family outbreaks, 459 of them were connected to institutions and 26 were community related. Aetiological agent of the 485 non-family outbreaks was calici/norovirus in 272 instances, 37 were caused by rotavirus, 42 by salmonellae, one by shigellae, two by campylobacter and 29 by *Clostridium difficile*. Epidemiological investigation of the remaining 102 episodes was unsuccessful in identifying the causative agent; the bacteriological aetiology was excluded. Ninety-five outbreaks (12,2 %) were qualified massive (defined as affecting 30 or more people).

In the most extensive calici/norovirus outbreak (contact and aerosol transmission) 241 cases were identified. The epidemiological evidences suggested contact and/or aerosol-borne transmission in 48 out of the 95 massive outbreaks. Transmission via a common medium was identified in 10 outbreaks; foodstuff/food was found to be the likely source in seven and confirmed in two additional cases. Transmission route was unknown in the remaining 17 massive outbreaks (18 %).

There was only one outbreak where drinking water was confirmed as the transmission medium by epidemiological analytical methods. In this incident 35 cases were identified out of 86 persons exposed after a pipe break (unknown aetiology, municipality Komló, Baranya County, 2011). One smaller, presumably pool water related conjunctivitis outbreak was reported; it was probably caused by adenovirus (Hajdú-Bihar County, 2012).

In the period between 2010 and 2012, eight clusters of probable or confirmed nosocomial legionellosis and seven travel associated ones were reported with 20 and 14, cases, respectively. In 12 cases the domestic hotwater system and in 3 cases the whirlpool was identified as the most likely infective source.

In the field of the laboratory surveillance, which is highly important for the diagnostics of communicable diseases, there was no substantial progress because of the limited institutional and financial possibilities. There is a considerable lag in the field of protozoon diagnostics that may also spread with water. For similar reasons, the professional supervision of the private laboratories is insufficient in some areas of work.

The epidemiological information system was further expanded due to advancement in the healthcare informatics supported by the European Union. The family doctors' notifications were integrated into a joint system improving the timeliness of the surveillance. It is a codified regulatory target that all healthcare providers should electronically submit report on the modifiable diseases (both the clinical observation and the laboratory finding) to the competent regional public health institute. It will accelerate the dataflow and renders the detection of the suspect cases and their clusters or outbreaks faster and more reliable. Similarly, the active inpatient care providers have an obligation to submit daily electronic anonym report to the Expert Information System of the National Public Health and Health Officers Service on the patients receiving emergency assistance. Daily reporting allows

continuous status recording in the field of hygiene and epidemiology. The communicable disease reporting subsystem of the epidemiological expert information system is currently being tested. The technical assets of reaching the target are substantially available; the current target date of the completion is 2014.

Progress is foreseen in the detection and consequently the reduction of legionellosis cases as the effect of the first legally binding regulation setting the requirements of environmental *Legionella* monitoring, which is also envisioned to come into force in 2014.

III. ACCESS TO DRINKING WATER (ARTICLE 6, PARAGRAPH 2 (c))

Target:

1. Comprehensive assessment of the population without access and of the possible solutions. Target date: 2008.

2. Elaboration of a social financial assistance system for water fees to ensure the right to water for all. Target date: 2010.

The number and ratio of households with access to the public drinking water supply is presented in the chapter on common indicators (Part 2). The drinking water supply of the population is close to the economically feasible maximum.

The revised targets concern first of all the complete revision of the relevant regulations of the public utility services in the framework of a new legal act and its implementing decrees. During the multi-phase implementation extending until 2017, independently from the economical status of the population, the conditions for a high level, economically sustainable water supply should be ensured.

The Hungarian Constitution declares the right to drinking water, the provision of which is the responsibility the municipality. Though public drinking water supply has been available in all municipalities, endeavours of the Act No. CCIX of 2011 on public water utility service (hereinafter referred to as „WUA") to improve the regulatory framework are nevertheless justified.

Principal targets of WUA are as follows:

- Protecting national property, settling the ownership structure. WUA was set out in parallel with the Act No. CXCVI of 2011 on National Property (hereinafter referred to as „NPA"). NPA provides an exhaustive list of the assets, which comprise the National Property. A significant proportion of the public water utilities will be transferred into public ownership as a result of the provisions of the WUA. Nearly 90% of the sector will be in state or municipal ownership.
- Price regulation: the Minister in charge shall determine the service fees of the public water utility service in a ministerial decree and the Hungarian Energy Office (hereinafter: HEO) will oversee the legitimacy of the implementation regarding the fees to be paid. Currently the fees, fee types, pricing principles and the content of the fee vary by service area and from one local authority to another. Under the present circumstances extreme differences prevail in the water and sanitation prices on the municipality level (ranging from 102 HUF/m^3 to 1893 HUF/m^3). The aim of the price regulation is to even out the differences and to develop a balanced system (based on solidarity) by establishing common basic principles of tariff setting. WUA determined the baselines of the fee structure, the content of the fee and the solidarity principles.

The charges have to be set to ensure safe water utility services at the lowest possible costs, the improvement of the efficiency of operation, the effective use of capacities, the continuous improvement of service quality, including the allowable costs of safeguarding the water resources.

- Integration (to redefine the fragmented public water utility service market and to make it more transparent). Currently there are 373 public water utility service providers in Hungary - with different economic and financial background and contractual framework - providing operational or service activities. The integration will enable the service providers to effectively use the water resources and to deliver (approximately) equal quality services and ensure efficient continuous operation. One of the instruments to achieve this goal is the integration of the market players. The principle of regionality and solidarity and the prohibition of cross-financing could also contribute, as a result of integration, to the implementation the declared targets.

The WUA mandated the Government to set out the detailed rules of implementation in a government decree. Implementation regulation includes the rules of establishing the tender procedure, which is required for the conclusion of the operational agreement, of designating a public supplier (and its rights and obligations), of licensing decisions and the content requirements of the license. The 58/2013 Government Decree outlines the rights and obligations of the public water utility service provider, and the information to be disclosed to the HEO by the public water utility service provider and by the responsible authority. The WUA called for the establishment and management of a public registry and empowered the HEO to control the public utility developments and reconstructions by approving 15 years rolling development plans consisting of development, replacement and investment programmes.

The minister of national development is mandated to ensure the implementation of the WUA through ministerial decrees and by-laws and the HEO bears the responsibility of licensing, supervision and data management related to the regulated public utility services.

One of the guiding principles during the implementation of the WUA is solidarity, which is intended to be applied through a pricing mechanism that enables an approximate equalisation of the operational costs affecting the water charges and allows to provide services at a more affordable water charge also in settlements where unfavourable conditions apply with regard to the expenses of the service. The minister of rural development – responsible for the environment and water – is entitled to prepare the rules of the price support and propose an appropriation also foreseen to be used to partly cover the cost of temporary water supplies in settlements which lack drinking water of acceptable quality. The Public Health and Medical Officer's Service's orders the above municipalities to provide safe drinking water through alternative means, e.g. in containers or water tank trucks to the population or the endangered part thereof. The available budgetary resource is annually announced in a ministerial decree. In 2012, the price of the drinking water was maximised at 498 HUF/m^3 or the charge for drinking water and sanitation together at 1002 HUF/m^3. Municipalities where the unit expenses surpassed this limits were eligible to apply for support. The funding is used to cover the difference between the limit and the unit expenses.

IV. ACCESS TO SANITATION (ARTICLE 6, PARAGRAPH 2 (d))

Target: Collection and treatment of communal sewage by biological treatment, nitrogen and phosphorous removal:

1. in agglomerations over 10000 PE on sensitive areas, target date: end of 2008,
2. in agglomerations over 15000 PE, target date: end of 2010,
3. in agglomerations between 2000-15000 PE, target date: end of 2015.

Additional targets were identified in the revision of the regulation under the new legal framework (WUA and the complementing decrees). Multiphase implementation is planned to be completed by 2017, and aims to ensure a high quality, economically sustainable sewage treatment, independent of the region or the financial status of the population.

Sanitation and wastewater treatment is the responsibility of the state or the municipalities, according to the Hungarian legislation. The legal framework of wastewater utilities is the same as outlined in the previous chapter, especially in regard of the regulations of the WUA.

Safe disposal of communal wastewater is one of the priorities of environmental protection. It is also an obligation under the 91/271/EEC Directive. Remaining targets and target dates in access to sanitation are unchanged since the last report.

- Collective sewage system and at least secondary (biological) treatment in agglomerations of 2000-15000 PE on both the sensitive and other areas by Dec 31, 2015.

- Though there is no EU obligation for agglomerations under 2000 PE, funds can be obtained through the Regional Operative Programme (ROP), and investments are in progress.

The ratio of household connected to a collective sewerage system increased from 71.3 % to 72.5 % between 2008 and 2010. Accessibility in the rural was 44.37 %, while in urban areas, almost double (87.30 %) in 2010. Compared to the previous years, the number of household not connected to the collective system in areas where the service was available, decreased from 7.9 % in 2008 to 7.5 % in 2010.

As a result of the intensive development in the area after joining the EU, 70.7 % of the collected wastewater was released into the receiving water body after at least biological treatment by 2008. With the opening of the Budapest Central Wastewater Treatment Plant, it increased to 96.5 % by 2010. The ratio of sewage undergoing tertiary treatment also increased significantly (17.5 % in 2002, 38.3 % in 2008), reaching 72 % in 2010. On the household level, wastewater from 50 % of the households was treated by at least biological treatment in the beginning of 2008, this rate also increased to 96.5 % by the end of 2010. As an effect of the above development, the discrepancy between households connected to public drinking water supply and those connected to a collective sewerage system decreased from 23.8 % to 19.68 %, thus reaching the EU average of 20 %.

The length of separated and combined sewers (receiving rainwater as well) was 39020 km in 2010; it is 671.2 m wastewater pipelines for every km of drinking water distribution system.

The actions of the National Sanitation and Wastewater Treatment Programme (covering agglomerations over 2000 PE) are achieved through tenders using EU funding, the own funds of municipalities and state support. The funding framework for the investments projects is the Environment and Energy Operative Programme (KEOP). The action plan of the Healthy, Clean Community Priority line under KEOP has a budget of 420199 million HUF for 2007-2013. The funds already used or committed and the planned funds for the remaining time period are summarized in Table 14.

Table 14

Commitments and planned funds under KEOP 1.2.0

KEOP Programme	2007-2009 commitment (million HUF)	2010-2011 commitment (million HUF)	2012-2013 planned funds (million HUF)
1.2.0 for sewage collection and treatment	118 858	204 182	97 100

The available budget for 2014-2020 will be determined based on the revision outcome of the current Wastewater Programme.

The Regional Operative Programme (ROP) is aimed at solving wastewater collection and treatment in agglomerations below 2000 PE. Available budget and spending schedule of ROP is summarized in Table 15. The volume collected and treated sewage is shown in Table 16.

Table 15

ROP project funds
(million HUF)

2007-2008	2009-2010	2011-2013	*2007-2013*
12673	18440	4096	*35209*

Table 16

Volume of the collected and treated wastewater, 2007–2010
(1000 m^3)

Year	Collected wastewater	Treated wastewater	Treatment		
			Only mechanical	Biological	Tertiaty treatment**
2007	516 493,88*	413 195,10	1 024,10	177 293,71	234 877,29
2008	513 342,81*	410 674,25	896,62	119 893,72	289 883,91
2009	423 267,20	414 745,43	892,87	123 189,40	290 663,16
2010	629 836,88	619 128,32	11 443,10	170 357,59	437 322,62

* Estimated value

** Nitrogen and/or prohporous removal

There is no available data for 2007 on the volume of the untreated wastewater release in Budapest. Total volume of collected wastewater was estimated based on the assumption of the 2008 National Wastewater Programme estimating the portion of untreated sewage 20 %.

The large increase in the treated wastewater volume between 2009 and 2010 is the effect of the operation of the Budapest Central Wastewater Treatment Plant with the capacity of 1.1 million PE. 2010 was also an uncommonly rainy, the increased precipitation also added to the collected volume of wastewater, as there is still combined sewerage is most places. Occasional sewage overflow may have contributed to the increase of the mechanically treated water.

Information on the technical and economical attributes of the water utilities is collected through the water utility reports (OSAP 1376) by the Water Utility Department of the National Environmental Institute, assisted by the their local offices. The local offices – having an insight on their area – keep up the communication with the data providers and provide assistance in understanding and completing the data survey. The outcome of the data analysis is published in the Municipal Wastewater Information System. Results are checked and validated by the regional offices of the National Environmental Institute and the Environmental and Water Inspectorates.

V. LEVELS OF PERFORMANCE OF COLLECTIVE SYSTEMS AND OTHER SYSTEMS FOR WATER SUPPLY (ARTICLE 6, PARAGRAPH 2 (e))

and

VI. LEVELS OF PERFORMANCE OF COLLECTIVE SYSTEMS AND OTHER SYSTEMS FOR SANITATION (ART. 6 (2) (e) continued)

Target: No target was set to date. Future goal is to reduce water loss on the distribution system and to eliminate lead pipes in the connection lines.

Water utilities (drinking water supply and wastewater treatment) require an official licence for operation. The companies operating the services are either owned or contracted by the body responsible for the supply (usually the municipality). Since 2012, legal framework of the water utility services changed (see Chapter III.), opening a transitional period of reorganization in the sector, which is expected to last until 2017.
The Water Utility Act transfers the official supervision of the water utilities from the Ministry of Rural Development to the Hungarian Energy Office. Main tasks of the Office are to give suggestion on the centrally set prices of the water utility services to the Minister responsible for the water utilities, who will determine the price in a ministerial decree (as of 2015 it will be a further task of the Office to determinate the amount of water utility development funds); to control the pricing, water utility authorization, approval of the reconstruction, replacement and investment plans under the rolling development plans and to ensure compliance to the further obligations under the Water Utility Act (see also Chapter III and IV).

Table 17

Indicators of changes in the water utilities between 1992-2010
(data from the National Environmental Institute)

	1992	**2008**	**2010***
Length of drinking water mains (without the connecting pipelines) (km)	55 309	57 240	58 132
Connected households	3,45 million	3,9 million	4,03 million
Volume of supplied water (m^3)	775 million	564 million	564,5 million
Employees at the water utilities	55 000	18 500	NA

Table 18

Selected performance indicators of the Benchmarking Club partner companies*

Parameter	2008	2011	Unit
Abstracted water	429 996	517 560	1000 m^3
Supplied water	404 008	501 345	1000 m^3
Delivered (sold) water	305 948	401 186	1000 m^3
Water loss in distribution	98 060	100 159	1000 m^3
Rate of water loss	24,3	20,0	%
Average age of the distribution system[1]	31,8	31,8	year
Length of the drinking water mains, without the connecting pipelines, simplified system	NA	7200	km
Length of the sewerage pipelines mains, without the connecting pipelines, separated system	NA	30 390	km
Average age of the sewerage system[1]	20,0	21,9	year
Volume of wastewater treated by:			
mechanical only	0	17 453	1000 m^3
biological treatment	46 566	384 943	1000 m^3
nutrient removal	115 768	334 117	1000 m^3
Total	162 334	402 396	1000 m^3

1. Average weighted with system length

* The number of reporting companies was 21-23 in 2008, 34 in 2011.

VII. APPLICATION OF RECOGNIZED GOOD PRACTICES TO THE MANAGEMENT OF WATER SUPPLY, (ARTICLE 6, PARAGRAPH 2 (f))

Target: There was no target set under the Protocol.

Drinking water regulation requires the water supplies serving more than 5000 people or supplying more than 1000 m3/day water to establish a water safety plan (WSP). The obligation comes into force in a rolling fashion depending on the size of the supply: deadline for the submission of the WSP to the Chief Medical Officer's Office for approval was July 1,

2012, for supplies serving 100 000 or more people, it is July 1, 2013, for those serving 50000-100 000 people, and July 1, 2014 for the ones serving 5000-50000.
A future target in the area is to extend water safety planning to the small water supplies as well, based on the recent WHO guidelines.

VIII. APPLICATION OF RECOGNIZED GOOD PRACTICE TO THE MANAGEMENT OF SANITATION (ART. 6, PARAGRAPH 2 (f))

New collective sewage systems and wastewater treatment investments are established in accordance with the Best Available Technology. There are no targets or target dates in the area, and no relevant information on the progress.

IX. OCCURRENCE OF DISCHARGES OF UNTREATED WASTEWATER (ART. 6, PARAGRAPH 2(g) (i))

As of Dec 31, 2010, only 1.8 % of the wastewater collected through public collective systems (which is 72.5 % of all sewage) is released into the receiving water bodies after only mechanical treatment (practically untreated). The increase of the treatment to almost 100 % is the effect of the opening of the Central Wastewater Treatment Plant of Budapest (see also Chapter IV).
In rural areas, where the ratio of households connected to collective systems is much lower, individually collected sewage may still be illegally drained or discharged into the environment. Illegal discharge will decrease with the increase of connected households, which is now mandatory (if the service is available) under the Water Utility Act. The Ministry of Rural Development initiated a programme for installing household wastewater treatment devices in areas where collective systems are technically or financially not feasible.

X. OCCURRENCE OF DISCHARGES OF UNTREATED STORM WATER OVERFLOWS FROM WASTEWATER COLLECTION SYSTEMS TO WATERS WITHIN THE SCOPE OF THE PROTOCOL (ART. 6, PARAGRAPH 2 (g) (ii))

See Chapter IV.

XI. QUALITY OF DISCHARGES OF WASTEWATER FROM WASTEWATER TREATMENT INSTALLATIONS TO WATERS WITHIN THE SCOPE OF THE PROTOCOL (ART. 6, PARAGRAPH 2 (h))

In Hungary, the general legal framework exist to ensure that pollutant discharge into surface water is always under official supervision, and the dischargers are obliged to check their wastewater treatment technologies and to assess if requirements of the permits are met. The authorities determine the discharge threshold limit values according to the regulations (water quality, individual and technological limits) and considering the capacity and water quality of the recipient (environmental quality limits), the possibilities of best available techniques and the polluter pays principle. According to the legal regulation it is prohibited to discharge pollutant directly into groundwaters.

If the emission by the user of the environment exceeds the allowed limit or the authority orders more strict requirements (in line with its legal mandate), the discharger has to develop and implement an approved pollution reduction program and keep to a given schedule. This

ensures that the amount of wastewater discharge decreases on both local and country level. The licences are regularly revised by the authority and are usually valid for no longer than 5 years. The pollution reduction programs have to be integrated into the program of measures of the River Basin Management Plans, thus contributing to reaching the good status of waters. Violating the requirements of the law or the licence will result in an administrative fine.

The legal regulations oblige the users of the environment to monitor their discharges in a self-control system and to provide data to the environmental authorities on a regular basis.

In accordance with the regulations the authorities supervise the dischargers. Altogether 10 regional inspectorates for environment, nature and water and one national inspectorate (about 1000 people) perform the environmental administrative tasks including the licencing and supervision of water use. They carry out about 7000-8000 official inspections annually, some of which include environmental analysis as well.

The risk of hazardous substances from industrial dischargers reaching the environment is significantly reduced by the fact that in Hungary, as in other EU Member States, the potential large dischargers (industrial or agricultural) have to obtain an integrated environmental permit which defines that the level of discharge has to be kept as low as possible by the best available technology. So far, in Hungary more than 1200 IPPC projects received permissions. These facilities are subjected annually to a comprehensive inspection by the authority, covering all areas of concern.

In the period of 2010-2012, several minor legal modifications were accepted regarding also the regulation of wastewater discharges. The Ministerial Decree of the Ministry of Rural Development (10/2010) on the threshold limits for surface water pollution and their enforcement was launched with the aim to protect surface waters against priority and other polluting or toxic substances. As a result of EU law harmonization, the regulation contributes to reaching the good ecological and chemical status of surface waters, the environmental objective of the Water Framework Directive.

The modification of the Government Decree 314/2005 is currently in progress in order to make it compatible with the new industrial emission directive of the EU. As a result of the modification, the requirements of the Water Framework Directive regarding hazardous substances will be included in the requirements of integrated environmental permits, thus ensuring further reduction of contamination.

With prospects to the future, the enlargement and reinforcement of employees and controlling capacity of the environmental authorities are necessary to enable a greater number of control events over the users of environment. Official environmental measurements should be performed in a greater proportion including the control of priority hazardous substances characteristic of technological processes to discover incidental sources of pollution. The efficient programs of authority measures have certain preconditions: one is a more detailed and targeted comprehensive water quality monitoring which assesses the occurrence and amount of these pollutants in surface waters. Another precondition is the development of an emission inventory which assesses the sources of discharges and the routes of pollution dispersion through which pollutants can reach waters (directly or by transmission via air or soil). The implementation of these tasks puts a significant workload particularly on the inspectorates for environment, nature and water responsible for the official control and environmental monitoring tasks.

XII. DISPOSAL OR REUSE OF SEWAGE SLUDGE FROM COLLECTIVE SYSTEMS OF SANITATION OR OTHER SANITATION INSTALLATIONS

and

XIII. QUALITY OF WASTEWATER USED FOR IRRIGATION PURPOSES (ART. 6, PARAGRAPH 2 (i))

Agricultural reuse of sewage sludge requires an official license, based on a soil protection plan. The soil and plant protection directorate of the county government offices issue the licence as the competent soil authority.
Compliance with the licence is regularly controlled by the authorities. Data on sewage sludge reuse is reported annually. Every 3 years, a report is prepared for the European Commission under the 86/278/EC Directive on sewage sludge reuse.
Latest available data on sewage sludge reuse is from 2010 (Table 19). Concentration of toxic compounds in the slugdes used in the agriculture is very low, none of the samples exceeded the limit value set in the Government Decree on environmental application of sewage sludge.

Table 19

Concentration of toxic compounds in sewage sludge used in agriculture

	2005	2006	2007	2008	2009	2010
Amount of sewage sludge in agricultural use (ton/year)	42,329	32,813	39,944	43,077	36,920	47,242
Agricultural area treated with sewage sludge (ha/year)	7,069	6,406	7,865	8,006	7246	5869
Concentration of toxic compounds in the applied sludge (mg/kg dry weight):						
Cd	1.42	1.37	1.70	1.77	1.21	1.45
Cu	160.97	184.72	197.62	251.50	212.9	173.2
Ni	27.38	26.00	36.24	44.81	29.95	23.99
Pb	37.34	36.21	59.11	56.88	32.76	23.96
Zn	773.56	824.74	1092.92	1355.16	972.5	760.8
Hg	1.29	1.74	2.20	1.66	1.57	1.12
Cr	48.37	57.30	45.70	89.58	48.47	33.17
As	n.a.	n.a.	9.05	6.47	7.75	8.24
Nutrient content of the applied sludge (kg/ton dry weight):						
Nitrogen (N)	30.43	30.41	26.23	28.00	32.84	46.34
Phosphorous (P)	10.99	13.92	13.27	11.78	15.22	21.33

Disposal or reuse of sludge from the communal wastewater treatment plants will be a key issue in the near future, as the possibilities of disposal will be decreasing with the modification of the legal framework. As the agricultural reuse is limited by the pollutant level of the sludge, alternative (recultivation or energy) uses need to be considered. The large volume of the produced sludge requires the development of a sewage sludge treatment and disposal action plan by the municipalities responsible for the operation of the wastewater

treatment plants. Under the Municipal Sewage Information System (TESZIR), a database was launched in 2009, collecting information on the amount of sewage sludge generated, the quantity used as a renewable energy source, and the energy produced.
Cumulated amount of the renewable energy produced in the wastewater treatment plants in 2010: biogas for on-site use 360 948 550 MJ/year, biogas energy 253 625 270 MJ/year, electric energy 9 752 710 MWh/year.
Hungarian legislation on sewage sludge disposal and reuse is currently under revision. The new legislation will promote the reuse for energy production over the agricultural use. According to the revised policy, it will be mandatory for communal wastewater treatment plants over 25000 PE to produce and use biogas.
Biogas production is not economically feasible at all wastewater plants in Hungary, at least 25000 PE load is necessary. According to 2010 data, currently there are 85 wastewater treatment plants over this threshold, 27 of which use sludge fermentation; the remaining 58 do not produce biogas yet. Facilities for biogas production are planned to be installed between 2014-2020 in a government-funded programme.

Table 20

Sewage sludge production in communal wastewater treatment plants

Year	Total sewage sludge (1000 t dry weight/year)
2006	216 428
2008*	266 658
2010*	236 043

*Table refers to wastewater treatment plants in the Wastewater Programme

Trends in ratio of disposal and reuse of sewage sludge are summarized in Figure 2 and 3. Source data of the figures is identical.

XIV. QUALITY OF WATERS USED AS SOURCES FOR DRINKING WATER (ART. 6, PARAGRAPH 2 (j), first part)

Target: detailed assessment of the state of water bodies used as sources of or designated as future source of drinking water; preparation and implementation of intervention plans to reduce pollution in order to facilitate the good status.
Target date: preparation of the plans: 2009, implementing: 2015.

Almost 80% of groundwater abstraction serve the purpose of drinking water supply (94% of drinking water is provided from groundwater, mainly from gravelly sandy and karstic aquifers) in Hungary. In most areas, groundwater quality is suitable for drinking water supply; in some cases of deep groundwater treatment is necessary, other types need disinfection only.

In the gravel-sand aquifers of the basins, the dissolved solids content of waters is less than 1 mg/l. At some places iron, manganese and ammonium can be detected in high concentration, while in some areas the arsenic, boon or fluoride content of the deep groundwater causes problems in utilisation.

Karstic waters have a low dissolved solids content and are highly suitable for drinking water supply; however they are more liable to surface pollution. (See details in Chapter I on drinking water quality and Chapter XVIII. on the remediation of polluted sites)

The National Drinking Water Source Protection Programme started in 1997 with the aim to protect vulnerable drinking water sources from contamination by human activities and to preserve the natural (good) quality of waters in the sources presently exploited and the ones to be used for drinking water supply in the future (prospective drinking water resources). The requirements of drinking water source protection are set out in Government Decree 123/1997. (VII. 18.)

The scope of Government Decree 123/1997. (VII. 18.) covers the sources of water used for drinking water supply, the utilisation of mineral- and medicinal waters, both exploited or designated for future uses, and the facilities serving the treatment, storage and distribution of water for such uses serving at least 50 persons on a daily average.

Protection is ensured by the designation of protection zones around water abstraction facilities and the introduction and enforcement of restrictions within the protection zones and the establishment and operation of a monitoring system.

According to the WFD, the protection of drinking water sources has to be subject of special focus in the River Basin Management Plans. Measures for the protection of drinking water sources were therefore included in the RBMP.

Financial support for the designation of protective zones and the implementation of the necessary measures serving the protection of water quality has been ensured from state budget and since 2007 from the Environment and Energy Operational Programme (KEOP) and other EU funds.

At present, 1740 public water sources are recorded, out of which 903 are situated in areas sensitive to pollution from the surface (vulnerable drinking water sources) and more than 70 are recorded as prospective groundwater sources based on their favourable hydro-geological characteristics. In addition to the groundwater sources, 16 surface water sources are used as raw water for drinking water supply.

Activities launched or finished in the period 2009-2012 in the National Drinking Water Source Protection program (NDWSP):

Calculation of the protective zones, elaboration of the measures for vulnerable public and prospective drinking water sources (dws.):

	2009	2012
Finished	343	363 (307 vulnerable and 56 prospective dws.)
In progress	24	13 (11 vulnerable and 2 prospective dws.)

KEOP financed projects for the calculation of the protective zones, elaboration of the measures for vulnerable public and perspective dws:

	2009	2012
KEOP funded projects	projects for 36 vulnerable or perspective dws. in progress	projects for 61 vulnerable dws. finished/in progress
		projects for 13 perspective dws. finished

Calculations for further 250 dws. not financed by the NDWSP were carried out and an additional 64 are in progress in 2012.

Altogether protective zone calculations for 718 dws. (both NDWSP and other) were finished or in progress in 2009, and 764 (693 vulnerable and 71 perspective dws.) by 2012.

So far around 44% of the sources for public drinking water supply (67% of vulnerable sources) have been secured by the delineation of protection zones, which provide almost 90% of public drinking water supply in Hungary.

Diagnostic works for the remaining dws. are to be scheduled according to the amount of the available funds.

XV. QUALITY OF WATERS USED FOR BATHING (ART. 6, PARAGRAPH 2 (j), second part)

Target: Status assessment of the identified bathing waters under the River Basin Management Plan, design and implementation of action plans to reduce contamination.
Target date: 2015

235 freshwater bathing sites were identified in 2012 in Hungary. 204 bathing waters are lakes or reservoirs, while 31 are river beaches. Most of the lakeside beaches are on the large lakes (Balaton: 139, Velence Lake: 9, Tisza Lake: 6). Oxbow lakes and mine pit lakes are also used for bathing. Targets on the monitoring of bathing waters, development of an electronic bathing water quality database, and public participation were achieved as planned. The EU Bathing Water Directive 2006/7/EC was translated into the national legislation in 2008 (78/2008 Government Decree), but only came fully into force in the 2010 bathing season. The National Institute on Environmental Health, responsible for the implementation of the Directive and specifically for the coordination of the monitoring, developed and operates the bathing water quality database. The database is the data source for reports to the Government and the EU, and information to the public. Experiences in the implementation process are used to support revision of the targets and the policy framework to assist implementation. During the summer, large number of bathers uses other beaches than the designated bathing sites. There are no estimates on the number of non-designated, occasionally or regularly used beaches or the people using them.

List of the designated bathing sites is publicly available on the public health portal (http://www.antsz.hu/portal/portal/furdoviz1.html). Information on the bathing water quality is posted weekly on the NIEH website (www.oki.antsz.hu) in an interactive map format.

In the 2012 bathing season, 95.3 % of the assessed designated beaches were compliant, moreover, 80.3 % even fulfilled the criteria to be qualified as excellent. 22 bathing sites (10.3 %) were not assessed, either because they did not open for the season or there was no sufficient data for the assessment. Poor status was assigned only to 5 beaches (mostly on Upper Tisza).

The local public health offices prepared the bathing water profiles for all designated sites, and published them on their websites. These documents were based on the EU Bathing Water Directive, and provide a risk characterisation for the beaches. Bathing profiles are also available on the NIEH website.

As future targets and actions, a modification of the regulation was proposed to improve bathing water monitoring and data quality. According to the proposal, bathing water monitoring, which is currently the responsibility of the operator and performed by accredited laboratories, will become an official task of the public health services. Potential future target is to decrease the number of non-monitored bathing sites (the proposed modification of the regulation also targets this area).

XVI. QUALITY OF WATERS USED FOR AQUACULTURE OR FOR THE PRODUCTION OR HARVESTING SHELLFISH (ART. 6, PARAGRAPH 2 (j), third part)

Target: Status assessment of water used for aquaculture under the River Basin Management Plan, design and implementation of action plans to reduce contamination.
Target date: 2015

The freshwaters needing protection or improvement in order to support fish life are designated according to the Directive 2006/44/EC. They include surface waters which in their present state or after the reduction or elimination of water pollution would be able to support can sustain the natural biodiversity of the characteristic native fish species. Harmonized to the Directive, the Hungarian legislation has dedicated legal instruments for freshwaters covering the protection of aquatic habitats. The Ministerial Decree 6/2002 of the former Ministry of Environment and Water sets limit values and the control thereof for surface waters used for drinking water abstraction, prospective drinking water sources and those where conditions for fish-life shall be ensured. The decree does not apply to waters of natural or artificial fish ponds used for intensive fish-farming. Hungarian fish waters were designated by the decree. The competent environmental authorities supervise the designation every five years; currently seven watercourses fall under the scope of the decree. Limit values for water contamination were determined by the decree in order to ensure the sufficient quality of fish waters. The authorities are required to develop programs of measures for water protection – based on the pollution reduction plans of the dischargers – in order to comply with the set limit values.

In Hungary fresh water fishery has centuries-long history. The geographical, aquatic, geothermic and climatic conditions are favourable for not only traditional fishpond fish production, but for natural water fishery and intensive fish farming as well. By the end of the 19th century, the majority of the large bog, marsh and wetland areas disappeared due to the river regulation works on the rivers Danube and Tisza. Consecutively, large-scale construction of artificial fishponds was started. The largest systems of fish ponds were

constructed on the Great Hungarian Plain with dikes on all sides (so-called paddy ponds) and were connected to the water system and attached irrigation canals of Tisza and Körös. In the valleys of the Transdanubian region, generally smaller barrage ponds were constructed in large numbers.

In the terminology of the European Union, fishery covers fishery in natural waters, including marine and aquaculture and freshwater (or inland water) fishery and aquaculture. The technology of domestic freshwater fish production differs significantly from the European practice therefore in Hungary regarding aquaculture intensive fish farming and fishpond production have to be distinguished.

Natural water fishery means the utilization of water courses and still waters (e.g. lakes, oxbow lakes, reservoirs), where water circulation and biological processes, especially nutrient circulation, are fully based on natural processes.

Intensive industrial fish farming is such an industrial activity where both the input and output sides are fully controlled, natural processes do not influence the production. In Hungary intensive industrial fish farming is present typically in artificial ponds or closed – pool or caging system.

Fishpond production differs fundamentally from the above-described technologies. In its current form it takes place mainly in artificial ponds, where fish farming is based on material circulation processes typical of natural water habitats. Accordingly it works as an open ecological system, where due to the interacting natural and technological processes the emission of materials cannot be separated.

Regarding the covered surface area, fishpond production dominates domestic fishery with more than 90%. The most commonly produced fish species are common carp, silver carp, grass carp and some predator fish species (catfish, zander and pike), produced usually under extensive conditions. Fishpond production and the associated fish breeding in fish hatcheries also have an important role in producing breeding material for natural waters (protected and endangered endemic fish species as well).

In 2011 in Hungary the total amount of fish produced by fishpond production and intensive fish farming was 22 585 tons out of which 16 346 tons were directly consumed. The difference is the amount of fry and juvenile fish carried over to the next years as stocking material (Table 21). The gross fish production exceeded the production of the previous year by 9%, the fish production for food-use by 15%.

Table 21

Fish production in Hungary in 2010-2011

Year	Fishpond production		Intensive fish farming		Total	
	(tons)					
	gross	food-use	gross	food-use	gross	food-use
2011	**20 249**	**14 280**	**2 336**	**2 066**	**22 585**	**16 346**
2010	18 559	12 306	2 114	1 938	20 673	14 244
2011/2010 (%)	109%	116%	110%	107%	109%	115%

In 2011 fishpond production was practiced on 24 364 hectares, which exceeds the previous year by 3%. Intensive fish farming took place on 11 farms on a total of 16 267 m^3 production volume. The fish production for food consumption on the intensive fish farms increased by

7% compared to the previous year. 95% of the produced amount of fish on the intensive fish farms is African catfish.

Fishery management has a significant impact on the status of waters; therefore the good ecological status of natural waters should be reached by taking the aspects of fishery and angling into account and by the active participation of the stakeholders.

The greatest environmental impacts are associated with intensive fish farming, because of the high organic matter and nutrient content of the effluent. In addition, the geothermal energy used for optimizing the water temperature of the basins is also significant. At the same time, the water use of intensive fish farming is more favourable than the high water demand of extensive fishponds. However, depending on their construction, besides fish production as a primary goal fishponds contribute to habitat preservation and provide other functions as well, like water management, environmental conservation, tourism and multifunctional pond management.

The combined intensive-extensive fish farming systems have not spread in Hungary yet, but it is expected that such systems will have increasing importance. During the development of fish farming technologies the combination of intensive aquaculture with the water management systems of fish ponds emerges as an obvious solution. Thus the organic and nutrient rich effluent of intensive ponds is treated in an extensive fish pond. This way the ecosystem of the extensive fish pond takes part in the conversion and retention of the nutrients that left the intensive ponds and uses them in a subsequent fish farming cycle (e.g. pond in pond system).
In Hungary the rivers and their tributaries, streams, lakes, reservoirs, canals, mine pit lakes and oxbow lakes are all places beloved by anglers. Currently 3.3% of the population angles, which is around the European average. In Hungary, angling is possible on about 140 thousand hectares of water surface, in 2010 nearly 340 thousand anglers and more than thousand angler associations were registered.
There is no shellfish production in Hungary thus there is no distinct regulation concerning this subject. General fish management regulation applies to harvestable shellfish, while environmental protection regulation to endangered species.

XVII. APPLICATION OF RECOGNIZED GOOD PRACTICE IN THE MANAGEMENT OF ENCLOSED WATERS GENERALLY AVAILABLE FOR BATHING (ART. 6, PARAGRAPH 2 (k))

Target: 1. Revision of the national regulation. Target date: 2013.

2. Development of best practice guidance documents for the operators and the bathers. No target date.

Hungary due to its favourable geothermic situation is very rich in thermal waters, which has strong economic potential through tourism and thermal energy use. Investments of thermal water use receive government support, and development in this area was dynamic even in the past years of recession. Local population also uses the thermal water for therapeutic purposes – health and life quality improvement are one of the greatest benefits. There are 560 registered publicly available bathing facilities – from apartment houses and hotels to aquaparks - operating altogether 3514 publicly available pools.
Unfortunately, the policy environment did not follow the rapid expansion in technology and the number of pools. The Government Decree 121/1996 and the Ministerial Decree 37/1996 regulating the pools (both from 1996) are long out-dated, their scope does not cover new

types of pools and pool facilities or new bathing habits. Non government organizations (professional associations) in the field (Hungarian Baths Associations, Building Engineering Division of the Chamber of the Hungarian Architects, Hungarian Association of Pool Technology) have major role in initiating and driving progress in the development of best practice documents and also provide technical support for policy making. Three EN technical standards were translated (on pool equipments and water slides), and three Hungarian standards developed (on pool water treatment, occupational safety in pools, pool design and building requirements). From the regulatory side, a guidance document on Legionella risk prevention was published.
Revision of the legal background is still in progress. The aim is to publish the revised Government Decree on the establishment, and the Ministerial Decree on the operation of the pools by the end of 2013. Major points of the revision are the regulation of the design and operation requirements, especially in operator education, pool designer authorization, more efficient legal control in opening new or reconstructed facilities, health risk management of new pool types, and setting up and up-to-date, evidence-based water quality surveillance and requirement system. Targets on the institutional level is the reorganization of the pool designer, engineer and operator education, and introducing professional third party auditing of the pools. Further progress is necessary on bather education.

XVIII. IDENTIFICATION AND REMEDIATION OF PARTICULARLY CONTAMINATED SITES (ART. 6, PARAGRAPH 2 (l))

Target: The identification and registration of contaminated sites, the reduction or elimination of the risk of contamination and the assistance of reduction or elimination of contamination (under the National Environmental Remediation Program (OKKP).

In 1991, the Government ordained the survey, exploration and elimination of accumulated environmental contamination in Point 17 of the “Short- and medium-term environmental action plan”. Point 18 outlined the solution to the environmental problems of abandoned soviet barracks and training grounds. Due to the shortage of funding, only the tasks listed in Point 18 were initiated. However, the action plan enabled the Government to commence the short and medium-term tasks of the OKKP in 1996.

The number of contaminated sites and the sources of contamination – regardless of responsibility – covered the OKKP were estimated to be around 30-40 thousand in 1994-1996 by the studies supporting the launch of the programme. The cost of in depth exploration and remediation was estimated to be over 1000 billion HUF and 30-40 years were predicted as the required timeframe for the implementation of the programme. As the countrywide identification of the contaminated sites progressed, through the utilization of different archives and databases the estimated number was reduced by half. In the first phase of the identification process the Remediation INFO (KÁRINFO) database was set up and 15 thousand potentially contaminated and contaminated sites were registered. After validation and revision of the database by 2005 the number of the registered contaminated sites was reduced to 1100.

The registry was further revised in 2007, bringing on datasheets of new contaminated sites or of new content. Presently almost 2000 sites are registered as potentially or definitely contaminated in the need of some means of remediation.

The legal basis for the remediation is provided by the Act LIII of 1995 on the protection of Nature and the Governmental Decree 219/2004. (VII. 21.) on the protection of ground waters.

The main priorities of remediation:

1. protection of human health
2. protection of waters
3. protection of other environmental elements and wildlife
4. restoration and reuse of contaminated sites, stimulation of the economy

Beside the individual remediation investments - regardless of responsibility sphere - the OKKP involves general countrywide tasks. These are related to the management and execution of the OKKP (research, regulation, information technology, registration) or to the coordination of either sub-programmes controlled by the responsible ministers or remediation constructions. The yearly reports and summaries on the fulfilled tasks are published on the website of OKKP (http://www.kvvm.szakmai/karmentes)

In 2003, the number of closed and abandoned but not recultivated landfills and those that were assigned to be closed by 2009 and then recultivated was 2667. In 2008 only 141 landfills were operating out of which 73 were active, 68 had to be closed by 15th July 2009. In 2012, 100 landfills were operating. In Hungary, only landfills meeting the engineering requirements of the 1999/31/EC directive 'on the landfill of waste' can operate. At the same time it is a very costly and long-term task to recultivate and – if needed – remediate all the landfills that are not engineered properly.

The national budget with EU funds provides financial incentives for municipalities to implement the necessary measures (KEOP, ROP). Currently the deposition of waste is so strictly regulated that (theoretically) no significant amount of hazardous substance can leach from the landfills with proper engineering. However, the closed and less accurately built landfills waiting to be recultivated and the illegal landfills can be problematic. The proper engineering prevents the leachate from getting into surface or ground water. It is especially important to remove the illegal waste from wet areas.

After the withdrawal of the soviet army, the survey of the caused environmental damage was started which concerned 330 municipalities, 171 garrisons and altogether 48 thousand hectares of land. On 20 sites, immediate remediation was ordained. In 1991-92, during the remediation process 2.7-3 million m^3 contaminated ground water was treated and 200-220 thousands m^3 waste was disposed.

The progress of remediation can be demonstrated mainly by the progress in the remediation of abandoned environmental damage under state responsibility. There is no comprehensive database about the remediation tasks, which are ordained and carried out on the polluter pays principle, thus this part of remediation is not predictable. Between 1996 and 2012, remediation of more than 500 sites was funded by the state.

Since 2nd April 2008 under the Environment and Energy Operative Programme (KEOP) the tender scheme titled 'Executing remediation tasks on contaminated sites' (KEOP-2.4.0) enables the implementation of remediation projects. The projects are supported by the EU and co-financed by the Cohesion Funds. The aim of this tender scheme is to reduce the contamination of ground water and geological formations by the remediation of contaminated sites and engineering.

The reduction or elimination of contamination in ground water relies on the priorities of the National Remediation Priority Lists (NKPL) according to the following:

1. Remediation of the highly sensitive ground water protection areas under the Governmental Decree 219/2004. (VII. 21.) 'on protection of ground waters' which is harmonized to the 2000/60/EC Water Framework Directive (EU requirement)
2. Reduction of contamination risk of ground water on highly sensitive, sensitive and less sensitive areas based on the National Remediation Priority Lists.

Table 22 shows the progress in terms of EU funds allocated in the 2007-2013 period for remediation tasks of contaminated sites and contaminating landfills (published on the website of the National Development Agency - NFÜ).

Table 22

EU funds for the remediation of contaminated sites 2007-2013

KEOP programme	submitted tenders	fund requested (million HUF)	number of tenders supported by the managing authority	Funds allocated (million HUF)	Number of contracts	sum of valid contracts (million HUF)	Number of payments	sum paid (million HUF)
2.4.0.	26	42 872	22	39 790	21	32 555	11	6 978

The indicators for assessing the progress of KEOP have not yet been calculated because of the on-going projects, exact numbers can be obtained only after the financial closure of the investment period.

Due to the global economic crisis, the central budget reduced the available funds for remediation. The financial limitation and the lack of information on the progress of non state funded remediation, targets and target dates cannot be set in the present phase.

Regarding the objectives of the WFD, it is imperative to eliminate the contaminations and risks from the protective areas of drinking water sources by 2015. Only good ecological status is acceptable as the environmental goal but there are several reasons why reaching this is questionable. Such reasons are the complexity of improving the status of ground waters, the financial deficiency in case of state responsibility tasks, or in other cases the lack of solvency of the polluter.

Special case study

At noon on 4th October 2010 the dam of the red sludge reservoir n.o. X of Kolontár of the MAL Ajka aluminium plant collapsed. The following events happened with dramatic speed and caused the death of 10 people. The highly alkaline water contaminated with aluminium and toxic metals immediately flooded Kolontár. Following the accident 600-700 thousand m^3 red sludge and water mixture inundated the deeper parts of Kolontár, Devecser and Somlóvásárhely. The red sludge covered 800 hectares of the surrounding area. The most damage was caused in the villages near the reservoir, Devecser and Kolontár. The unprecedented disaster concerned seven settlements. The industrial disaster needed immediate intervention for life protection and safeguarding, protecting environmental and natural values and agricultural areas. The main task for the emergency workers was to prevent the contamination of the Danube and thus prevent a more serious ecological disaster of unforeseeable consequences for neighbouring countries as well. As a result of cooperation, strong effort and proficiency further damage was prevented and the population was secured. According to the press conference of the UN Special Rapporteur after the on-the-spot investigation of the results of the remediation in 2012, the promptness and expertise of the Government, the Directorate General for Disaster Management and the involved

organizations and the constant monitoring of both the status of environment and human health was exemplary.

XIX. EFFECTIVENESS OF SYSTEMS FOR THE MANAGEMENT, DEVELOPMENT, PROTECTION AND USE OF WATER RESOURCES (ART. 6, PARAGRAPH 2 (m))

Target:
1. Diagnosis of the vulnerability and safeguarding of water resources. Target date: 2007-2015.
2. Accomplishment of diagnosis for 100, and safeguarding of further 200 water resources. Target date: 2009-2012.
3. Reduction of nitrate pollution from agricultural sources in the planned schedule. Target date: 2015.

Hungary, as an EU member state is obliged to fulfil the requirements of the Water Framework Directive (2000/60/EC Directive, WFD) and to achieve and maintain the good ecological and chemical status of surface waters and the good chemical and quantitative status of groundwaters at water body level. As a tool for implementation, the River Basin Management Plan (RBMP) of Hungary was completed in 2009 determining the range of necessary measures to be implemented programmatically in order to reach the environmental objectives. These tasks are the primary priorities of the national water policy, since they have been determined by the river basin management plan that was announced by the Governmental Decree 1042/2012 as a result of an extensive public and administrative consultation. The complete RBMP and its background documents are available at www.vizeink.hu.

The deadline for reaching the good status is 2015, which – if duly justified – exceptionally can be extended till 2021 and 2027. During the development of the first RBMP Hungary resorted significantly to the option of exemptions to extend the deadlines, considering that on major portion of the water bodies sufficient information and data was not available for WFD compatible evaluation. Furthermore, many of the necessary improving measures significantly exceed the financial capacity of the country. The most important chapter of the river basin management plan is the Program of Measures which summarizes the measures needed for reaching the good status of waters – following the timing determined by the plan – at the latest by 2027.

On the whole, in 2009 8% of river, 18% of lake and 68% of groundwater bodies achieved good status. The target for 2015 is reaching 10%, 21% and 69%, while for the period of 2021 68%, 69%, 77% should be achieved. *(There targets are identical to the previous report, see Figure 4.)* The deadline of implementing all relevant programs of measures is 2027.

The implementation of the Program of Measures of the first national RBMP was started in 2012. The assessment of the implementation of measures is currently (at the time of this report) ongoing and the development of the 2nd RBMP, which will be adopted in 2015, was started.

In the period of 2010-2015 (and also for longer term) the most important task for Hungary regarding the protection of surface and groundwaters is establishing, planning in detail and implementing these measures, which affect not only water management but other sectors as well.

The requirements of WFD were adopted through several water related regulations to the Hungarian legislation. The tasks of river basin management regarding the contents of the plans were ordained in the Governmental Decree 221/2004. The decree along with other

water related legislation was slightly modified in the period of 2010-2013 but the modifications have not changed the essence of the regulations.

The central budget did not enable a separate financial framework for WFD measures thus for the past period most of the related measures were those that had been initiated on other legal basis. The most important ones, which besides protecting the status of waters, directly or indirectly also contributed to the protection of the health of the concerned population:

- The development of urban wastewater system and treatment plants (EU Urban Waste Water Directive)
- Pollution reduction programs (implementation of IPPC directive, reduction of pollution caused by hazardous substances, etc.)
- Identification of contaminated sites, National Environmental Remediation Program
- Water Quality Improvement Program (EU Drinking Water Directive)
- Drinking Water Protection Program
- Protection against nitrate pollution of agricultural origin (EU Nitrate Directive)
- Sustainable use of thermal water resources

Beside the nationwide programmes, further supplementary measures are necessary in order to ensure the good status of water resources in accordance with the undertaken timeline of the river basin management plans. Primarily actual projects need to be executed regarding the establishment of water protection zones, riverbed rehabilitation programs, drainage and retention of inland inundation and the solution to the individual wastewater treatment of smaller settlements. These can be financed partly from national budget and mostly from EU funds.

Other chapters of this Report give a more detailed review on the most important set of basic measures connected to the “Water and Health” relation. As a supplement other such measures which are decisive regarding the protection and sustainable use of water resources:

Water quality monitoring systems:

In Hungary, the status of waters is assessed through a monitoring system, which has been functioning for decades. It is operated mainly by the authorities of environment, nature and water as a state responsibility but also the users of the environment have obligations to carry out analysis. The obligations for monitoring are required by legal measures of governmental and ministerial level.

Surface water monitoring includes the identification of biological elements and special hazardous substances which are relevant for both the ecological and chemical status and also those physical, chemical parameters and hydrological characteristics which influence ecological status.

Through surveillance monitoring, water quality of the rivers is observed on 124 locations and of the lakes on 23 locations on a monthly basis. In addition, under the operative monitoring programmes, monitoring takes place on 470 further locations (with lower frequency) with the aim of determining more precisely the effects of specific pollution sources and the efficiency of actions taken.

The monitoring system for observing groundwater status is comprised of the regional and the environmental use subsystems. Regional monitoring means the monitoring systems operated by state organizations, which observes the quantitative status of groundwaters and observes and follows the long-term changes of the qualitative status resulting from natural factors and

human diffuse impacts (non-point sources of pollution). The aim of the environmental use monitoring, which is composed of the measurements and observations made by the users of environment, is identifying the effects of point source impacts on groundwaters. Regular analysis for determining the chemical and quantitative status of groundwaters takes place in about 3200 sampling wells

There are special monitoring systems operating on the protection areas of different legal origin (bathing waters, protected water resources, nature conservation areas) and on the most significant surface waters (Lake Balaton, Lake Velence).

Reducing the chemical contamination of waters:

According to the WFD priority substances are those chemical pollutants, including pesticides, which may particularly damage the water ecosystem functions or human health. Therefore regarding these substances frequent monitoring and status assessment and, in case thresholds are exceeded, the implementation of basic and supplementary measures are necessary.

In 2010 the new national regulation on the limit values and their application for the surface waters was introduced. The aim of the new ministerial decree level regulation is to reach the good status of surface waters with special regard to the chemical status. According to the regulation, the prevalence of priority substances has to be monitored in surface waters or in the biota. The pollution reduction programs, which are necessary for reaching good status in case the limit values are exceeded, have to be presented in the river basin management plan. The authorities have to consider these thresholds during the authorization procedures.

In 2011, new regulation on the technical specifications of the assessment and monitoring of the chemical status of waters was introduced. Its application ensures reliable monitoring data for chemical status assessments.

Under the 2009/128/EC Directive on establishing a framework for Community action to achieve the sustainable use of pesticides, every Member State has to develop a National Action Plan. At the end of 2012, the Hungarian National Action Plan on Sustainable Use of Pesticides was accepted. It is important to develop and introduce integrated pest management and safer alternative plant protection technologies in Hungary. The action plan pays attention to the protection of natural habitats, wildlife and the main principles of the Water Framework Directive. The aim of the plan is to reduce the risks of pesticide use, promote rational and appropriate use over incorrect practices, to substitute the need for pesticide with agro-technical methods. The implementation of the action plan is ongoing.

Reducing water contamination of agricultural origin:

The Hungarian legislation adopted the Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources in the Government Decree 27/2006. The new action programme has been developed following the four-year compulsory revision. The Ministerial Decree 59/2008 of the former Ministry of Agriculture and Rural Development outlines the action programme under the Directive. It was modified in December 2012; the new action programme is effective since 11th January 2013.

In November 2012 Hungary prepared and sent to the EU Commission its national report on the implementation of the directive in which the nitrate content of surface and groundwaters, the eutrophication status of surface waters and the efficiency of the action programme were assessed. Based on the report, the Ministry of Rural Development developed a short-term action programme under which the extension of designated nitrate sensitive areas from 45,7% to approx. 69% (of the area of the country) – especially in order to improve the status of eutrophic surface waters – is ongoing in the first semester of 2013.

The implementation of the measures of the first national river basin management plan is ongoing. The summary of the significant – ongoing or finished – measures of the period 2009-2012:

1. Projects on reducing nutrient and organic matter load
   a. Agriculture: 488 000 million HUF
   b. Industrial and communal: 510 000 million HUF
2. Information technology development: 4697 million HUF
3. Projects on reconstruction, rehabilitation, revitalization: 187 800 million HUF
4. Projects on safeguarding water resources: 14 683 million HUF

The drafting of the 2nd RBMP has started and it is by 22nd December 2015. In 2013, according to the plan, the revision of the environmental pressures influencing the status of waters will take place, including the compilation of the emission inventory of primary hazardous substances. The possible modification, clarification of the objectives of the first river basin management plan will be considered during the second river basin management planning process.

XX. THE FREQUENCY OF THE PUBLICATION OF INFORMATION ON THE QUALITY OF THE DRINKING WATER SUPPLIED AND OF OTHER WATERS RELEVANT TO THE TARGETS (Article 6, (2) n)

Target: Setting up a dedicated website for the Hungarian implementation of the Protocol.
Target date: 2008.

The Hungarian website to the Protocol was set up by the target date and since then it is amended with varying frequency in parallel with the activity of the Expert Committee (www.viz.wesper.hu).
There was major development in the past few years in the reporting and information to the public on drinking water quality. In Hungary, drinking water is monitored mostly by the self-control measurements of the operators, and with lower frequency by the local public health authority. Results of the self-control and official analysis are reported to the regional public health services of the county government offices every 3 months, where it is summarized and sent to the central database. The reporting system was reorganized in two steps (2010, 2012); the previous multiple data entry and manual data transfer was replaced by a partially automated system. Simultaneously, a data analysis software was developed for the central database. Previously, time-demand of the data analysis hindered up-to-date, nationwide information to the public, and yearly reports were published with years of delay. Following the information technology development, water quality data is entered directly into the central database with the legally required 3 months frequency, and the previous full year's data is made available to public by mid-year. Information to the public on the municipality level drinking water quality is available in an interactive map format, national summary is published as an on-line document on the National Public Health Service website (www.antsz.hu, oki.antsz.hu). The websites are also useful resources of additional guidance documents related to water quality, e. g. drinking water monitoring parameters, potential reasons, risks and solutions of non-compliance (with special focus on arsenic and lead), household water treatment devices, *Legionella* risk etc.
Information to the public includes bathing water quality as well. Since 2008, the laboratories directly send the bathing water monitoring results to a central database, thus eliminating the

loss of time and data quality from multiple data transfer. Bathing water quality data is posted on the National Public Health Service website, as an interactive map or county listing (www.antsz.hu, oki.antsz.hu). The published quality information includes both the 4 years' assessment required by the EU, and the recent results.

XXI. Additional national or local specific target

Target: Development of the water management aspects of climate adaptation. Key tool towards the goal is the National Water Strategy.

Under domestic circumstances on average every second year was considered to some extent dry, droughty. The extent of drought-affected area varies greatly each year: in case of the most severe drought situations it can reach 80% of national territory. The area exposed to the risk of flooding exceeds 35 thousand km^2 – which in relation to the total area of the country is among the largest in Europe – since one fourth of the country is under flood level. This involves 2.5 million of the population, one third of the cultivated land, 32% of railway network, 15% of public roads and 30% of the GDP of Hungary.

The national objectives and task concerning climate change are specified by the National Climate Change Strategy, which was accepted by the Hungarian Parliament in 2008. Due to the meanwhile evolution of the course of international and EU policy and published policy documents it was necessary to partially update the requirements of the National Climate Change Strategy. Act LX of 2007 on the implementation framework of the UN Framework Convention on Climate Change and its Kyoto Protocol regulates in detail the required content of the National Climate Change Strategy. During the update to the prescribed components the national mitigation framework was added which should take into deep consideration the prevention of risks and reduction of damages related to climate change and climate security. Since in Hungary out of the expected consequences of climate change the risks concerning water management (drought, flood, inland excess water) are especially significant, the national mitigation framework, which is being developed, has to emphasize these fields. As prescribed by the Act LX of 2007, the revised National Climate Change Strategy together with the national mitigation framework has to be accepted by the Parliament in 2013. The second National Climate Change Strategy has been approved by September 2013 and at present it is subject to administrative procedures and to societal dialogue.

In 2012 by the decision of the government the development of the National Water Strategy (NWS) was initiated, which will establish the water, irrigation and drought management policy of Hungary. At the time of the Water and Health Report the Strategy is still under development, it has to be finalised and announced by 30th June 2013 (Governmental Decree 1432/2012 on ordering the development of the National water management, irrigation and drought strategy).

The National Water Strategy emphasizes the tasks of climate change and drought management and presents a clear vision regarding the possible answers to the challenges of extreme weather conditions. With special attention to the importance of prevention the concept covers the following possibilities to prevent drought damage: land use compatible with available water resources, the role of the Water Framework Directive and river basin management plans, water retention, the efficiency of water use, the importance of information, drought risk management plans, the need for a new strategy for flood protection. The tools of the Strategy among other things consist of maintaining the current infrastructures of water supply, establishing new ones, applying water saving technologies, better utilizing

the storing capacity of soil, reconsidering the current practice of draining inland excess water and the tools of reducing damage through crop production.

The NWS not only deals with the risks resulting from the shortage of water but also aims to handle the questions related to flood protection. Therefore more attention is to be given to the integrated approach of extreme hydrological events, to the retention and storage of excess water and to the improvement of the Hungarian flood protection strategy by introduction of non-structural and more efficient measures.

In line with the EU Floods directive and with the aim of decreasing flood risk Hungary will elaborate new building and technical regulations for the flood plains. The aim of the new regulations is to increase flood safety and decrease number of inundations through laying down stricter rules for placing building and structures in river beds and flood plains and also will set stricter rules regarding crossing bridges and public utilities and for land use and forestry. A new approach will be used in case of structural measures, too. Instead of increasing the level of dikes we will prefer decreasing flood levels by more sustainable flood reservoirs.

In 2013 – after the government accepts the Strategy – the detailed action plan will be developed. In order to improve the efficiency of water management actions after highlighting the priorities we recommend the implementation of the necessary economic and institutional measures in three time-frames. The first timeframe is for the short-term tasks (until 2014), including the development of water management strategy and policy, the creation of the conditions for their implementation, preparation for the new EU budget cycle and other immediate measures. The second timeframe for medium-term measures (until 2021) contains the tasks of the strengthening water management institutions for the fulfilment of the strategy, which are adjusted to the financial plan of the EU for the 2014-2020 period. The third timeframe is for long-term tasks (until 2017) to be implemented by the strengthened water management institution. The detailed action plan will determine specific targets and target dates for each field.

In case of Hungary the most important water management objectives are the following:

- The primary objective of Hungary is reaching the good qualitative and quantitative status of surface and ground waters and their sustainable long term management
- To strengthen the international cooperation in the field of water management
- Beside the increased responsibility of the state we have to aim for the prevention of floods and possible retention of inland excess water
- The development of Irrigation Strategy
- The mitigation of climate change – development of Drought Strategy
- The reduction of agricultural loads on waters (fulfilling the requirements of the EU Nitrate Directive) on the assigned sensitive areas, promotion of the implementation of best practice techniques
- The status and future of water utility
- Strengthening the role of the state regarding water utility services
- Strengthening water authority and supervision actions, improving monitoring systems and databases.

With the fulfilment of the objectives above the government wishes to contribute not only to the improvement of the status of waters but through direct and indirect mechanisms of action to the higher level of protection of human health.

PART FOUR: OVERALL EVALUATION OF PROGRESS ACHIEVED IN IMPLEMENTING THE PROTOCOL

Implementation of the Protocol in Hungary was accelerated after the Meeting of the Parties on Jan 1st, 2007, by the establishment of the Expert Committee on Water and Health. Target and target date setting was followed by the regular interaction of the Expert Committee members, but the achieved progress is far from satisfactory.

Considerable improvement is seen in areas, which also fall under EU obligations, such as the wastewater treatment programme and river basin management. Due to financial, economic reasons – not in the least the EU recession – the progress in drinking water quality improvement, water source safety provision, and the recultivation of contaminated sites falls far behind the optimal, even though these areas are also covered by EU Directives. Similar financial difficulties hinder the implementation of first River Basin Management Plan, though there were a number of project-funded investments between 2010 and 2012, facilitating water resource quality improvement.

The above target areas are the major challenges of the near future. Drafting of the present report provided an opportunity to review the progress and problem areas of the implementation, and the outcomes will be used for the revision of the targets and target dates. The legal framework needs to be revised in many important areas, such as updating the operational criteria of water utilities, or the water quality regulation of natural and enclosed bathing waters. Though there was considerable improvement, still further development is needed in the informatics of water data collection and analysis, and the harmonization of the existing or developed databases. This is also the basis of development in information and participation of the public.

The Expert Committee intends to have greater involvement of the other stakeholders and the other ministries now responsible for some aspects of water management, beside the currently most active parties from the health, environment and water side and some NGOs.

International cooperation

Hungary needs strong cooperation with the countries of the Danube Basin in establishing and implementing a coordinated water policy, legally grounded by the Danube River Protection Convention (June 29, 1993, Sofia). The Convention came into force more than 15 years ago for the protection of the Danube and the Black Sea. The International Committee for the Protection of Danube River is responsible the implementation of the Convention, and acts as a cooperative framework for the international coordination of the EU Water Framework Directive implementation. The Danube River basin is the second largest in Europe, its area is shared between 19 countries, including 8 EU member states, 3 candidate members and 8 non-EU countries. The entire territory of Hungary belongs to the Danube basin.

Bilateral transboundary water conventions are in place since decades with all neighbouring countries. Hungary actively participates in the UNECE conventions, the Protocol on Water and Health, and other regional international cooperations for the protection of water and environment.

Hungary held the EU Presidency for the first time in the first 6 months of 2011. One of the key priorities of the Presidency was the sustainable water management. Our aim was to give emphasis in the EU policy to relevant water issues, such as the integrated management of

extreme hydrological events, protection of ecological services, improvement of international cooperation, and the relationship of water and international development.

The Danube Macro-Regional Strategy was accepted during the Hungarian EU Presidency. It is the second macro-regional developmental strategy in the EU. The aim of the Strategy is to safeguard job creation, economical growth and a viable Danube-region through meeting transboundary challenges in a coordinated way by harmonized the development policies of 14 riparian countries (out of which eight EU member states). Hungary – together with another member state partner – has been appointed to coordinate chapters 4 (protection of water resources) and 5 (reduction of environmental risks) out of the three priority areas under the environmental pillar.

Hungary assumed a major role in 2012 in the World Water Forum as well as in the preparation and representation of the water-priority areas of the Rio+20 Conference, also in order to facilitate the accomplishment of the water supply and sanitation related Millennium Development Goals (MDGs). We are committed to ensure enhanced attention and consideration to water related issues with special regard to the access to water and sanitation in the framework of global proceedings after Rio+20 like during the elaboration of the Sustainable Development Goals and the so-called post-2015 development goals. To support that Hungary has undertaken to organize in October, 2013 a high-level World Water Summit in Budapest in order to give an account on the results to date and to determine possible development courses.
The Budapest Water Summit was held 8-11 October 2013, the participants approved a declaration on the last day of the event. The declaration stressed that a sustainable world is a water-secured world. The document summarised in eight points what is necessary in the future to secure water. A new mechanism was urged to be established which could contribute to co-operation in issues related to water.

Our co-chairmanship in the UN working group established to decide on the SDGs is another opportunity and obligation at the same time enabling Hungary to continue being a notable actor in the global water scenery.

For the wider information and participation of the public, our aim is to facilitate access to „water and health" information and databases. Water related world days – such as the World Water Day on March 22 or the Danube Day on June 29 - are celebrated every year through a variety of events.

Research and education

In spite of the financial difficulties, EU funded and national projects still provide opportunity for water and health related research. A few examples from the key research areas of the Hungarian research institutes and universities: impact of climate change on the water-related viruses (FP7 project „Viroclime", www.viroclime.org); novel rapid methods for water pollution early warning systems (digital holographic microscopy; microbial community analysis in Hungarian extreme water environments (thermal waters, cave lakes, alkaline lakes).

Many Hungarian universities and colleges offer degrees in water chemistry, water biology, water engineering and environmental protection, both on graduate and postgraduate level. Connecting to the EU Presidency priorities, but extending well beyond its time-frame, there are programmes in water and health for the education of the younger generations (pre-school and elementary school children). Subjects include the protection of natural waters or the promotion of water consumption. Media attention usually focuses more to the negative news,

such as the current arsenic and lead issues in Hungary. However, it also facilitated a wider public debate on the protection, improvement, and sustainable management of our waters.

PART FIVE: INFORMATION ON THE PERSON SUBMITTING THE REPORT

The following report is submitted on behalf of Hungary in accordance with article 7 of the Protocol on Water and Health.

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Figure 2.

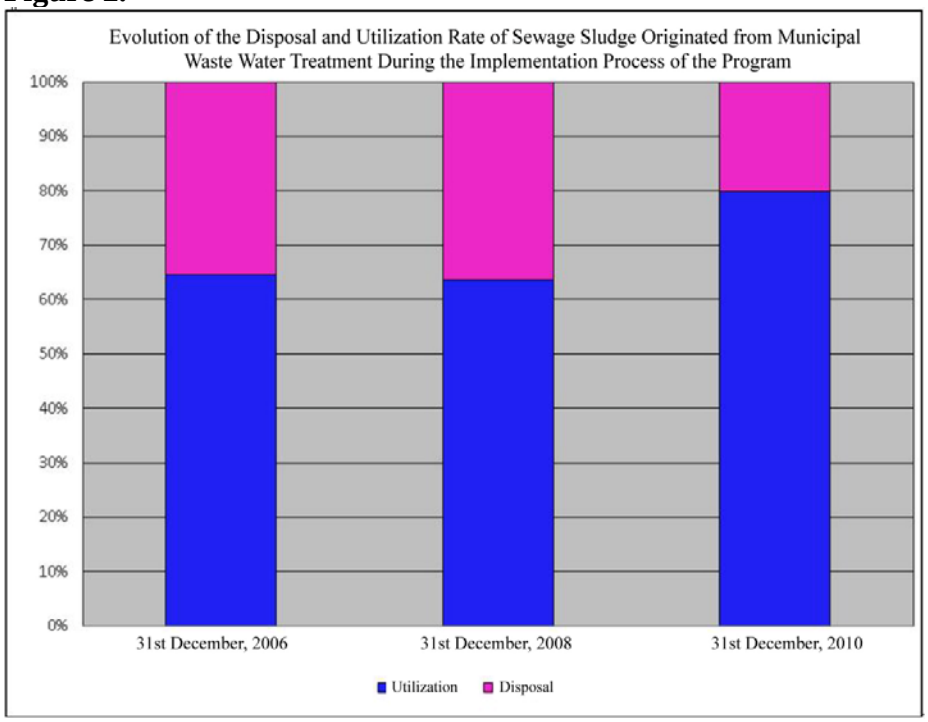

Figure 3.