

MINISTRY OF ENVIRONMENT OF THE SLOVAK REPUBLIC

Elaborated by: Water Research Institute Bratislava

Report

on Water Management
in the Slovak Republic in 2009

Bratislava 2010

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1 ROLE OF WATER MANAGEMENT

Main activities and undertakings of water management can be summarized as follows:

- general protection of waters and development of water resources,
- drinking water supply and wastewater collection and treatment,
- flood protection.

In 2009, the water management sector of the Slovak Republic continued in the process of fulfilling the tasks which result from the obligations in the field of water policy adopted at the national and international levels.

The priority actions of water sector were aimed at distribution of sufficient safe drinking water through public water supply systems and at wastewater treatment and collection using public sewerage systems.

The activities continued within the implementation of the Water Framework Directive and other European directives related to the membership of Slovakia in the European Union. The final version of the first output of implementation process – river basin management plans of the Slovak Republic – was completed at the end of 2009. The river basin management plans are fundamental documents for the Water Plan of Slovakia. The amended Water Act of November 1, 2009 represents a legislative framework for the Water Plan.

The Slovak Republic took over the presidency of the International Commission for Protection of the Danube River (ICPDR) in 2009. ICPDR is a platform for cooperation of the Danube countries in protection and sustainable use of the Danube River.

2 ORGANIZATION, MANAGEMENT, MACROECONOMICS AND PROPERTY STRUCTURE OF WATER SECTOR

2.1 Organization and Management

The water management sector is legally regulated under the Act No. 37/2010 Coll. amending the Act No. 575/2001 Coll. on the organization of activities of the Government and Central State Administration as amended in later regulations and amending the Act No. 400/2009 Coll. on the civil service and on amendments to some acts in wording of later regulations.

The Ministry of Environment of the Slovak Republic is a central body of the state administration responsible for development and protection of environment, including:

- water management
- protection of water quality and quantity and its reasonable use under the Act No. 364/2004 Coll. on waters and on amendment to the National Council Act no. 372/1990 Coll. on offences as amended in later regulations (Water Act), the Act No. 442/2002 Coll. on public water supply and public sewerage and on amendments to the Act No. 276/2001 Coll. on regulation of network industries as amended in later regulations
- flood protection
- fishery except aquaculture and sea fishing.

The Water Section is an organizational body of the Ministry of Environment. It comprises the following departments:

- Department of State Administration in the Section of Water and Fishery
- Department of Water Policy
- Department of River Basin Management and Flood Protection.

The Ministry of Environment manages the following organizations:

- three state-owned enterprises:
 - Slovak Water Management Enterprise, Žilina (SWME.),
 - Water Management Construction, Bratislava (WMC),
 - Hydroconsult, Bratislava (HYCO) – it merged with the Water Management Construction on November 1, 2009.
- two government-subsidized organizations:
 - Water Research Institute Bratislava (WRI),
 - Slovak Hydrometeorological Institute (SHMI),

The Ministry of Environment coordinates and manages the activities of the Slovak Environmental Inspection, regional environmental authorities, local environmental authorities and municipalities in the field of water, public water supply and public sewerage, fishery, and flood protection.

Other Organizations and Special Interest Communities

- Slovak Environmental Agency, Banská Bystrica
- State Geological Institute of Dionýz Štúr, Bratislava
- Association of Employers in Water Management in Slovakia
- Slovak Fishery Union, Žilina Council
- Association of Water Companies

Municipalities are other important entities which operate public water supply and public sewerage systems. Agricultural and industrial entities are significant water consumers and wastewater producers (50 % of all consumers and producers, respectively).

2.2 Development of Selected Water Management Indicators in Relation to National Economy

In 2009, the revenues of water management amounted to 642,002 thousand €. That represents an decrease by 54,017 thousand € compared to 2008. In relation to the Gross National Product of the Slovak Republic (63.3 billion €) it represents 1.00 %.

SWME Žilina shared 15.50 % of the total revenues, i.e. 99,498 thousand €. The revenues of water companies shared 64.04 % in amount of 411,120 thousand €, i.e. more than a half of the total revenues in water management. Other water management enterprises generated the revenues in amount of 131,384 thousand €, which is 20.46 % of the total revenues in water management.

In 2009, the water management sector reported profit which was influenced mainly by the total income of Water Management Constructions, state enterprise, Bratislava.

The number of employees in water management sector was reduced by 134 in 2009. The average salary has increased by 19 € compared to 2008 (table 2.2.1).

Surface water supply decreased by 34 million cubic metres.

The costs for particular activities in the field of water management were in the amount of 628,734 thousand € (SWME 17.26 %, other water management enterprises 15.01 % and water companies 67.73 % of the total costs).

table 2.2.1

Parameter	Unit	Year							
		2006		2007		2008		2009	
			index 2006/2005		index 2007/2006		index 2008/2007		index 2009/2008
GDP	billion €	55.0	111.7	61.5	111.8	67.2	109.2	63.3	94.2
thereof: water sector	billion €	0.67	113.0	0.63	93.5	0.67	106.4	0.64	95.5
Average number of employees in Slovakia	number in thous.	2,148.2	102.2	2,222.7	102.5	2,280.0	102.6	2,176.6	95.5
thereof: water sector	number	13,114	98.9	12,824	97.8	12,154	94.8	12,020	98.9
Average monthly salary	€	622.75	108.0	668.72	107.2	723.03	108.1	744.50	103.0
thereof: water sector	€	674	110.2	721	107.1	778	107.8	797	102.4

Source: Statistic Office SR, Statistic Report on Basic Development Trends in the Slovak Economy in 2006, 2007, 2008, 2009; state enterprises and water companies

2.3 Relation to the State Budget

Capital Expenditures (SWME)

No funds for capital expenditures were allocated to the Slovak Water Management Enterprise in 2009.

Current Expenditures (SWME)

Funds in amount of 5,655,979 € were allocated through the transfers to SWME, including:

- flood protection in amount of 1,000,000 € for repair and maintenance. This transfer was increased to 3,987,451 € during the year 2009.
- current transfers in amount of 1,664,970 € allocated to recover the costs for flood protection activities.

Capital transfers for government-subsidized organizations

Capital transfers for government-subsidized organizations in 2009:

WRI	0 €
SHMI	16,597 €
Total	16,597 €

Currents transfers for government-subsidized organizations

Current transfer in amount of 2,672,211 € was allocated to WRI in 2009.

Currents transfers for government-subsidized organizations in 2009:

WRI	2,981,902 €
<u>SHMI</u>	<u>6,314,168 €</u>
total	9,296,070 €

In 2009, water management organizations governed directly by the Ministry of Environment spent funds from the state budget in amount of 14,968 646 €:

Capital transfers to SHMI	16,597 €
Current transfers SWME	5,655,979 €
<u>Current transfers WRI+SHMI</u>	<u>9,296,070 €</u>
Total	14,968,646 €

2.4 Property Structure

Watercourses

The Slovak Water Management Enterprise has a crucial position in managing the watercourses of Slovakia in accordance with the Water Act.

Based on more precise digital processing of the river inventory by using qualitatively more precise data in a digital output of the water management maps at M 1:50,000 scale, the total length of rivers in Slovakia is 61,147 km.

The table 2.4.1 includes the overview of development on rivers and hydraulic structures between 2005 and 2009. In 2009, there were recorded no significant changes. New pumping station in Kalinové was built and 3 historical pumping stations are out of operation (Žitavská Tôň, Čergov, Viničné).

table 2.4.1

Indicator	Unit	Year				
		2005	2006	2007	2008	2009
Length of watercourses	km	38,183	38,211	38,217	38,217	38,217
thereof: trained watercourses	km	8,125	8,199	8,202.5	8,208.9	8,220.7
Major water management rivers and water supply watercourses	km	11,850	11,850	11,850	11,850	11,850
Length of protection dikes	km	3,127	3,135	3,135.2	3,135.2	3,135.5
Length of artificial channels and feeders	km	42	42	67	67	67
Weirs	number	210	216	217	216	216
Number of navigation locks	number	12	12	15	15	15
Pumping stations	number	71	72	72	72	70
Water reservoirs (total)	number	278	278	278	277	277
thereof: water supply reservoirs	number	8	8	8	8	8
Total capacity of water reservoirs	mil. m ³	1,908	1,908	1,908	1,908	1,908
Dry reservoirs -polders	number	14	20	20	20	20
Historical hydraulic structures	number	23	23	23	23	23

Source: SWME, state enterprise, Žilina – Annual report on administration and operation of watercourses and hydraulic structures, Economic Yearbook

Water Supply and Sewerage Systems

Development Overview – the systems in administration of water companies, local authorities, municipalities and other entities

table 2.4.2

Parameter	Unit	Year				
		2007	2008	2009		
				water companies + other*	Municipal	Total
Length of water supply system (without service pipes)	km	26,899	27,377	25,273	2,259	27,532
Length of service pipes	km	6,105	6,272	5,573	813	6,386
Number of service pipes	number	792,852	813,079	747,683	80,178	827,861
Length of sewage system (without service pipes)	km	8,506	9,266	8,083	1,575	9,658
Length of sewer service pipes	km	2,203	2,408	1,998	502	2,500
Number of sewer service pipes	number	291,457	326,915	275,696	66,032	341,728
Number of WWTPs	number	511	577	278	309	587

* Other entities: Water and Technical Service Hlohovec; Prevak Stará Turá
Source: WRI

3 WATER LEGISLATION

3.1 Legislative Process

In 2009, the legislative process was focused mainly on finalizing the acts within their legislative approval process and on preparing the provisions to these acts. The following legal regulations were finalized:

- *Act 384/2009 amending the Act 364/2004 on waters and on amendments to the Slovak National Council Act 372/1990 on offences as amended in later regulations (Water Act) and on amendments to the Act 569/2007 on geological activities (Geological Act) as amended by the Act. 515/2008* - approved by the National Council of the Slovak Republic on September 8, 2009 with effect from November 1, 2009;
- *Act 394/2009 amending the Act 442/2002 on public water supply and public sewerage systems and on amendments to the Act 276/2001 concerning the regulation in network industries* - approved by the National Council of the Slovak Republic on September 10, 2009 with effect from November 1, 2009;
- *the Flood Protection Act 7/2010* - approved by the National Council of the Slovak Republic on December 2, 2009 with effect from February 1, 2010;
- draft provisions to the Act 364/2004 on waters and on amendments to the Slovak National Council Act 372/1990 on offences as amended in later regulations (Water Act) as amended by the. 384/2009 :
 - draft regulation of the Slovak National Council establishing the criteria for assessing chemical status of groundwater body and the classification of groundwater body chemical status,
 - draft decree of the Ministry of Environment SR determining significant and sustained upward trends of pollutant concentrations in groundwater and methods of their reversal
 - draft decree of the Ministry of Environment SR defining the specifications on reference localities.

3.2 Standardization

The Water Planning Department of the Water Research Institute and SHMI Hydrological Standardization Centre deal with the technical standardization in water management sector and cooperation with international and European standardization organizations. Both are coordinators of technical standardization for water management and environment.

In 2009, the standardization activities for water management sector of the Slovak Republic were carried out in the following technical committees (TC):

- TK 1 Water Supply and Sewerage Systems
- TK 2 Amelioration
- TK 3 Hydraulics
- TK 27 Water Quality and Water Protection
- TK 64 Hydrology and meteorology
- TK 72 Environmental management.

The list of the Slovak Technical Standards for water management sector is available on the WRI website: <http://www.vuvh.sk/>.

The Slovak Institute for Technical Standardization is a member of the international and European standardization structures. Slovakia is a member of the International Organization for Standardization (ISO) and the European Committee for Standardization (CEN). It is obliged to comment on all draft standards and working papers.

4 IMPLEMENTATION OF WATER FRAMEWORK DIRECTIVE (WFD)

4.1 WFD Implementation Strategy Concerning the Requirements for Development of River Basin Management Plans

The main activities were aimed at finalizing the process of WFD implementation through the development of final versions of river basin management plans in accordance with the *Working and Time Schedule of Activities for Development of River Basin Management Plans* and the *National Strategy for WFD Implementation* which fully respect the strategy of the European Commission and the International Commission for the Protection of the Danube River (ICPDR). Prior to this process the following core activities were carried out:

- *publishing the proposal of the 1st version of the river basin management plans for comments, active participation and consultation of public;*
- *evaluation of the comments on the proposal of the 1st version of river basin management plans. An opportunity to comment on the published proposal of the 1st version of river basin management plans was taken by 11 entities. The final version of river basin management plans was published after evaluation of comments in December 2009.*
- *development of the final version of river basin management plans based on relevant comments and consultations of the involved parties. The Ministry of Environment submitted the Water Plan of Slovakia for comments in November 2009. The Water Plan should be a comprehensive document for water planning which consists of sub-basin management plans within the Danube and Vistula River Basin Districts. The Water Plan of Slovakia was approved in February 2010.*

In addition to the above-mentioned activities, other significant works were done, especially within the *assessment of ecological and chemical status of surface water bodies*. The results were included in the final version of the Water Plan of the Slovak Republic and in the management plans of sub-basins. A part of activities within the WFD implementation included the preparation works for the second planning period 2015 - 2021. These activities were aimed at updating the inventory of surface water types in Slovakia (reference localities), methodologies and determination of MEP and GEP for HMWB and AWB as well as classification schemes for the assessment of ecological status.

The activities at the national level continued along with the activities within the ICPDR. These were aimed at completing the final version of the International Danube River Basin Management Plan. At the same time, the works concerning the development of the River Basin Management Plan for International Sub-basin of Tisa River continued.

Following the Letter of Formal Notice of the European Commission No. 2007/2247 (infringement) concerning incomplete transposition of some articles of the Directive of the European Parliament and of the Council 2000/60/EC establishing a framework for the Community action in the field of water policy (WFD), the requirements for changing and completing the legal regulations were defined.

In total 37 comments were submitted. Out of this number, 34 comments were included and approved in the amendment to the Water Act (384/2009 Coll.) and in the legal regulations (Government Regulation 269/2010, Decree of the Ministry of Agriculture, Environment and Regional Development SR 2/2010). The rest will be included in 2010.

4.2 Implementation of Other EU Water Directives

In 2009, the implementation of 26 EU directives and regulations together with reporting to EC on the process of their implementation was in the competence of the Ministry of Environment SR. In addition, the Directive of the European Parliament and of the Council 2006/7/EC concerning the management of bathing water quality and the Council Directive 98/83/EC on the quality of water intended for human consumption are in the competence of the Ministry of Health of the Slovak Republic.

In 2009, the Ministry of Environment SR became responsible for implementation of the Directive of the European Parliament and of the Council 2008/56/EC of June 17, 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). This directive will be transposed to the Slovak legislation and implemented in the condition of the Slovak Republic in 2010.

There was an effort to perform activities in order to meet the requirements of the implementation programmes for particular directives/regulations. However, it was not possible in all cases mainly due to a lack of funds. Attention was mainly paid to requirements under the directives that were transposed to the Treaty of Accession of the Slovak Republic. The core activity was aimed at the implementation of the Council Directive 91/271/ECC on urban wastewater treatment dealing with the collection and disposal of urban wastewater mainly in agglomerations over 2,000 p.e.

The Ministry of Environment SR (through the Slovak Environmental Agency) submitted the following reports on the EU directives implementation programmes to the European Commission:

- *Situation Report on Urban Wastewater and Sludge Disposal in the Slovak Republic for 2007 - 2008*

The Situation Report provides information on legal framework for urban wastewater collection and treatment in Slovakia, responsibilities of Slovakia towards the EU in accordance with the Directive of the Council 91/271/EEC, conceptual and strategic documents, structure of urban areas and agglomerations, development of urban wastewater collection systems and treatment plants operated by water companies, collection and treatment of urban wastewater in agglomerations over 2,000 p. e., and production and disposal of sewage sludge.

The report is available for public on the website:

<http://www.sazp.sk/public/index/go.php?id=1167&idl=1167&idf=751&lang=sk>.

- *UWWTD Questionnaire 2009 of the Council Directive 91/271/EEC concerning urban wastewater treatment as amended by the Directive 98/15/EC*

Electronic UWWTD Questionnaire 2009 includes detailed information on flow of wastewater from the point of origin (agglomeration), through its collection and treatment up to the point of discharge in accordance with WFD. The questionnaire is related to agglomerations over 2,000 p. e. and it includes the defined connections among individual agglomerations, collecting systems, WWTPs and discharge points. Reference year for filling the questionnaire was the year 2008. This questionnaire is not available to public, since it contains data subject to protection of individual information in accordance with the Commercial Code. These data will be assessed by the European Commission and published in the report as the aggregate data for the Slovak Republic.

UWWTD Questionnaire 2009 was submitted to the EC through the ReportNet on December 21, 2009.

Cooperation between the Slovak Republic and the European Environmental Agency

The reporting to the European Environmental Agency (EEA) is among other responsibilities of the Ministry of Environment of the Slovak Republic. Through the SHMI, the Ministry prepared and submitted the following priority data flows to EEA: River quality (EWN - 1), Lake quality (EWN - 2), Groundwater quality (EWN - 3), State & Quantity of Water Resources (EWN - 4), pilot data for Water emission quality (WISE - 1) and in cooperation with the WRI also Biological data (WISE - 2).

4.3 Projects for Implementation of Directives Financed by the EU Funds

In 2009, the expenditures for the projects in the amount of 74.837 mil. € were covered by the structural funds within the Operational Programme: Basic Infrastructure - Provision 2.1. The EU funds were in amount of 58.128 mil. € while the co-financing through the state budget was amounted to 16.709 mil. €.

A non-repayable contribution of 368.102 mil. € was allocated within the Operational Programme – Environment. The EU funds represented 319.714 mil. € while the co-financing through the state budget was in the amount of 48.387 mil. €.

Detailed breakdown is included in the following table:

[in €] table 4.3.1

Priority Axis	EU Funds	State Budget	Confirmed Sum Non-repayable contribution (EU funds + state budget)
1 Integrated protection and rational use of water resources	277,458,762.56	41,838,742.92	319,297,505.48
2 Flood protection	42,256,168.09	6,548,697.25	48,804,865.34
Total	319,714,930.65	48,387,440.17	368,102,370.82

Source: Ministry of Environment SR – Section of Environmental Programmes and Projects

In 2009, 24 projects were funded from the ISPA Programme Fund in the amount of 249.293 mil. €. The EU funds were in the amount of 177.516 mil. € and the co-financing through the state budget was 71.777 mil. €.

The Cohesion Fund allocated 245.444 mil. € for 7 projects in 2009. The EU funds were in the amount of 205.035 mil. € and the co-financing through the state budget was 40.409 mil. €.

5 INTERNATIONAL COOPERATION IN WATER MANAGEMENT SECTOR

International cooperation continued in 2009 in terms of the following intergovernmental agreements, international treaty and international conventions:

Intergovernmental agreements and international treaty:

- Agreement between Czechoslovak Socialistic Republic and Hungary on Transboundary Waters.
- Agreement between Slovakia and Ukraine on Transboundary Waters
- Agreement between Slovakia and Poland on Transboundary Waters
- Agreement between Slovakia and Czech Republic on Cooperation on Transboundary Waters
- Treaty between Czechoslovak Socialistic Republic and Austria on Transboundary Waters

The following documents are in the process of preparation or ratification:

- Agreement between Slovakia and Austria on Water Management Cooperation on Transboundary Waters.
- Convention on Protection and Use of Transboundary Rivers and International Lakes UN Economic Commission for Europe (Helsinki Convention)
- Convention on Cooperation in Protection and Sustainable Use of the Danube River. The International Commission for the Protection of the Danube River (ICPDR) is established within this Convention. The Ministry of Environment of the Slovak Republic is a member of the ICPDR.
- Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention).

The following committees were established under the particular intergovernmental agreements:

1. Slovak – Austrian Committee on Transboundary Waters
2. Slovak – Hungarian Committee on Transboundary Waters

3. Slovak – Ukrainian Committee on Transboundary Waters
4. Slovak – Polish Committee on Transboundary Waters
5. Slovak – Czech Committee on Transboundary Waters

Particular measures and tasks (short-term, medium-term, long-term) were agreed at the regular annual meetings of the committees on transboundary waters. The discussed measures and tasks were included in the meeting minutes. The committee meetings are organized once a year

Working groups and expert groups are established for performing activities within the transboundary cooperation. The meetings of working groups are organized twice a year. Their activities result from strategies, guidelines and assignments set by the committees.

Multilateral Cooperation of the Slovak Republic with the Neighbouring Countries

Cooperation of transboundary committees with all neighbouring countries in 2009:

- Trilateral cooperation among the Czech Republic, Slovakia and Austria in protection of wetland area of international importance – Flood plain in the locality of the Morava-Dyje-Danube confluence (following the Trilateral Ramsar Platform);
- ETC Project (European Territorial Cooperation) included in the priority 1;
- Interconnection of Natural Habitats and the proposal of the Czech Republic to develop the BEST PRACTICE GUIDE;
- Biomonitoring programme initiated by the Slovak Republic in 2009. Slovakia proposed harmonization of this programme with Austria and the Czech Republic.
- In March 2009, the following outcomes of five working priorities of the Trilateral Ramsar Platform were discussed at the meeting held in Austria:
 1. Sustainable forest management and soil management
 2. Flood management and floodplain forest management, flood water retention in floodplain forests
 3. Natural and cultural heritage, evaluation of the potential of sustainable tourism
 4. Bio-corridor conservation
 5. Determination and monitoring of biodiversity indicators;

The committees agreed on the implementation of the projects and actions within ETS SEE (European Territorial Cooperation South-East Europe):

1. WANDA Project (WAsTe management for inland Navigation on the DAnube -) is a transnational project funded within the Programme of Territorial Cooperation 2007 - 2013 South-East Europe. The objectives of the project are aimed at joint development and implementation of measures assuring coordinated environmental approach to ship waste management.
2. NEWADA Project (Network of Danube Waterway Administrations) – the main objective is the improvement of cooperation among waterway administrators of the entire Danube Region in order to support inland navigation as the most effective and the most ecological type of transport.
3. DANUBE FLOODRISK Project – the objective is to implement the main requirements of the EU Directive concerning flood risk management on the Danube River. This project is led by the Ministry of Environment of Romania and it is supported by 18 European expert organizations of 8 Danube countries. The

goal is to develop maps of flood risk and flood hazard for the Danube floodplains and to harmonize the methodologies and data for practical use and development of the programmes of measures.

4. General Programme for the Implementation of NAIADES in Slovakia is based on the Notice of the Commission on the promotion of inland navigation NAIADES – Integrated European Action Programme for Inland Waterway Transport issued by the EC on January 17, 2006.

The programme includes recommendations for action to be taken between 2006 and 2013 by the European Community, its Member States and other parties concerned. NAIADES is aimed at five strategic areas: market, infrastructure, fleet, jobs and skills, and image of inland waterway transport.

In 2009, trilateral cooperation among Slovakia, Hungary and Ukraine continued in preparation works for the reconstruction of protection dike on the right bank of the Tisa River. The works coordinated by the ICPDR are expected to be finished by the end of 2009.

The committees also supported the implementation of pentilateral UNDP/GEF Tisa Project and the pilot programme aimed at the improvement of flood protection on the Bodrog River. The pilot programme will be implemented in cooperation among Hungary, Slovakia and Ukraine.

International Projects

In addition to the mentioned above, the most significant international projects focused on water management development in 2009 are as follows:

- Hydrodynamic numerical 2-dimensional model of the Morava and Dyje in Austria, Slovakia and the Czech Republic;
- SOCOPSE – Source Control of Priority Substances in Europe;
- Capacity Building in Water Sector of Turkey;
- SAMPLER – Development and verification of passive sampling technologies for monitoring of emergent and persistent organic pollutants in water;
- DINAMICS – Diagnostic Nanotech and Microtech Sensors;
- WATLIFE – Enhancement of Public Awareness on Importance of Water for Life, its protection and Sustainable Use;
- CEFAME is focused on transnational integrated flood risk management in the selected pilot area (Slovak territory - Morava, Danube, Váh);
- UNDP/GEF - Integration of the principles and strategies of ecological management into the landscape and water management in the region of Eastern Slovakia Basin (region of Laborec - Uh);
- WACO Project - cooperation with the Dutch experts of the Regge and Dinkel Water Board;

6 DESCRIPTION OF NATURAL CONDITIONS IN RELATION TO WATER AND WATER MANAGEMENT

6.1 Natural Conditions

The Slovak Republic is situated in the Central Europe. It borders on Austria, Czech Republic, Poland, Ukraine and Hungary.

The most of the territory is a part of the West Carpathians Mountain System and only the outmost northeast part belongs to the East Carpathians. The territory is included in the Carpathian Ecoregion. Lowlands cover almost one fourth of the territory - Vienna basin from the north, Pannonian Basin from the southwest and Great Danube Basin from the south-east. All these form a part of the Hungarian Lowland.

Maximum vertical dissection - energy of the relief expressed as a difference between maximum and minimum altitude is given by the value of 2,655 meters above sea level (Gerlachovský štít) - 94 meters above sea level (Bodrog - state border) = 2,561 meters.

Climate

The total precipitation in the Slovak territory for 2009 reached 851 mm which represents 112 percent of average conditions. The year 2009 is considered as a wet year regarding precipitation. Monthly rainfall totals in 2009 are shown in table 6.1.1.

Average rainfall in Slovakia for 2009

table 6.1.1

Month	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	Year
mm	51	65	87	16	63	114	72	75	40	97	80	90	851
% of average	112	156	186	29	82	132	80	93	63	159	130	171	112
Excess (+) Deficit (-)	5	23	40	-39	-13	28	-18	-6	-23	36	18	37	89
Description of precipitation period	A	VW	VW	VD	A	W	A	A	D	VW	W	VW	W

Notice: ED – extremely dry, VD- very dry, D – dry, A- average, W - wet, VW – very wet, EW – extremely wet

Rainfall totals for 2009 in individual river basin districts of Slovakia are shown in table 6.1.2. Following the precipitation period characteristics, the river basins of Hornád and Poprad (including Dunajec) can be considered as wet (123 % of average) while the Ipeľ river basin experienced the lowest rainfalls in 2009 (101 % of average). Most of other river basins were considered as average regarding rainfall totals in 2009 (104 – 119 % of average).

Average rainfall totals per river basin in Slovakia for 2009

table 6.1.2

River Basin Districts	Sub-basin	Catchment area [km ²]	Average precipitation [mm]	% of average	Precipitation Period Characteristics
Danube	Morava*	2,282	813	119	A
	Dunaj*	1,138	650	104	A
	Váh	14,268	918	109	A
	Nitra	4,501	787	113	A
	Hron	5,465	877	111	A
	Ipeľ *	3,649	690	101	A
	Slaná	3,217	830	105	A
	Bodrog*	7,272	836	119	A
	Bodva	858	812	111	A
	Hornád	4,414	838	123	W
Dunajec and Poprad	Dunajec and Poprad	1,950	1,034	123	W
Slovakia		49,014	851	112	A

* only Slovak part of river basins

A - average, W – wet

Hydrological Conditions

The geographic location of Slovakia on a watershed divide of the Black Sea and Baltic Sea (watershed divide passes along the Slovak- Polish state border and at the stretch between Štrba and Čirč it passes over the Slovak territory) along with natural conditions predetermines the situation of water management in our country. Water from 96 % of the Slovak territory flows through the Danube and Tisa into the Black Sea, while the remaining 4 % flows through the Vistula River tributaries into the Baltic Sea. The streams rising in our territory are rather unstable. High discharges occur regularly in spring from March to April (on Danube, Poprad and Dunajec rivers approximately 2 months later). Low discharges are observed during the summer and autumn periods.

A density of the river system varies from 0.1 km.km⁻² in the karst plains up to 3.4 km.km⁻² in paleogennic rocks of the flysch mountains. An average density of the river system is characterized by the value of 1.1 km.km⁻².

Water Resources in 2009

In 2009, the average annual runoff from the Slovak territory was 221 mm, which is 84 % of the long-term average. The runoff in individual river basins was in the range from 39 mm (Danube sub-basins) to 433 mm (Poprad and Dunajec river basins). The lowest runoff was recorded in the Bodrog River Basin (64 %) while the highest runoff was recorded in the Dunajec and Poprad river basins (126 %). The values of annual runoff for each river basin are shown in table 6.1.3.

Average annual runoff per each river basin in Slovakia for 2009 table 6.1.3

River Basin Districts	Sub-basin	Catchment area [km ²]	Annual runoff [mm]	% of average
Danube	Morava*	2,282	139	105
	Dunaj*	1,138	39	108
	Váh	14,268	294	93
	Nitra	4,501	114	80
	Hron	5,465	256	89
	Ipeľ *	3,649	111	82
	Slaná	3,217	181	96
	Bodrog*	7,272	190	64
	Bodva	858	125	76
	Hornád	4,414	226	108
Dunajec and Poprad	Dunajec and Poprad	1,950	433	126
Slovakia		49,014	221	84

* only Slovak part of river basins

Total water balance of water resources in Slovakia

table 6.1.4

Balance	Volume [mil. m ³]
	2009
<i>Hydrological balance:</i>	
Precipitation	41,715.000
Annual inflow to the Slovak territory	71,767.000
Annual runoff	85,546.000
Annual runoff from the Slovak territory	10,832.000
<i>Water management balance:</i>	
Total intakes (Slovakia)	629.094
Vapour from water reservoirs	61.680
Discharge into surface water	605.240
Effect of water reservoirs	123.425
	Accumulation
Total water supply in water reservoirs as of January 1 of the following year	931.100
% of storage capacity in accumulation water reservoirs	80.300
Water use rate (%)	2.590

Assessment of Groundwater Regime in the Hydrological Year 2009

In 2009, the highest values of groundwater levels were recorded in the period from February to April when the effect of above-average rainfall totals led to the rise of groundwater levels with maximum annual values. Maximum groundwater levels in the region of the Danube River Basin were recorded in July and rarely also in December. Maximum spring and well capacity was observed in the period from February to April. Minimum groundwater levels were observed during winter period from November to December and minimum well capacities were recorded in the period from September to December.

At present, the long-term maximum water levels and maximum well capacities are more frequently exceeded or, on the contrary, well capacities and water levels are often below the minimum. This may be a result of relatively short monitoring series as well as extreme weather events during the year (droughts, floods and storm rainfalls).

There were recorded higher and lower long-term average annual groundwater levels compared to the previous year. The long-term average annual groundwater levels in the river basins of Váh and Laborec decreased by 20 cm. On the contrary, the average groundwater levels in the river basins of Morava, Danube, Hron, Ipeľ, Slaná, Hornád, Bodrog and Latorica increased by +40 cm. Other catchments recorded both higher and lower groundwater levels (-20 cm up to +20 cm).

In 2009, the annual average water levels decreased by -50 cm up to -70 cm compared to long-term average values (river basins of Váh, Nitra, Hron, Slaná, Hornád and Bodva). An increase up to +50 cm was observed in the entire territory but mainly in the river basins of Danube, Morava, Bodrog and Latorica.

The average annual capacity of wells increased to 140 % in the river basins of Bodva and Slana. compared to 2008. On the contrary, the lower average annual capacity of wells was observed in the river basins of Váh, Orava and Nitra (from 70 to 95 %). Other river basins reached from 85 to 135 % of the average capacity of the year 2008.

A comparison with the long-term average capacity of wells shows a decrease of well capacity in most cases. A decrease was observed in the river basins of the upper and middle Váh, Orava, Slaná, Bodva and Bodrog (75 – 95 %). A lower capacity of wells was recorded in the catchment of the Nitra River (20 – 80 %). An increase in well capacity was documented in the river basins of Morava and Hornád (100 - 140 %). The well capacity in the river basins of Hron, Turiec and Poprad is in the range between 80 and 150 %.

Surface Water Quality

Surface water quality parameters monitored at all monitoring sites were evaluated in accordance with the Article 3, paragraph 3 of the Regulation of the Slovak Government 269/2010.

Surface water quality parameters were monitored in accordance with the Programme of Monitoring of Water Quality and Quantity for 2009. The Programme includes 244 sites of basic and operational monitoring. The table 6.1.5 shows the number of monitoring sites within the sub-basins.

The number of monitoring sites per sub-basin in 2009

table 6.1.5

Sub-basin	The number of monitoring sites per type of monitoring		
	Basic	Operational	Basic + Operational
Morava	8	4	6
Danube	3	8	5
Váh	35	30	21
Hron	16	7	2
Ipeľ	8	4	7
Slana	4	5	3
Bodrog	14	11	9
Hornád	10	1	7

Sub-basin	The number of monitoring sites per type of monitoring		
	Basic	Operational	Basic + Operational
Bodva	2		4
Dunajec and Poprad	2	5	3
Total	102	75	67

Generally, the monitoring frequency is evenly distributed during the year, i.e. 12 times a year in accordance with the Programme of Monitoring.

A lower frequency of monitoring is set for some biological parameters that are monitored on the seasonal basis (frequency 2 – 7 times a year), radioactivity parameters (frequency 4 times a year) and relevant substances (4 times a year).

The requirements for surface water quality defined under the Regulation of the Slovak Government 269/2010 were met at all monitoring sites in the following parameters:

- general parameters: total organic carbon, dissolved solids (dried and ignited), magnesium, sodium, fluorides, free ammonia, organic nitrogen, surface-active chemicals, selenium and dichlorobenzenes;
- radioactivity parameters: total volume alpha and beta activity, radium 226, tritium, strontium and caesium
- hydrobiological and microbiological parameters: cultivable microorganisms at 22°C

The limit values defined under the Annex 1 to the Regulation 269/2010 were exceeded most frequently regarding the following surface water quality parameters: general parameter - nitrite nitrogen (limit exceeded in all sub-basins), hydrobiological parameters - thermotolerant bacteria (exceeded in 7 sub-basins) and intestinal enterococci (exceeded in 8 sub-basins).

The lowest number of parameters exceeding the limits was recorded in the sub-basin of Dunajec and Poprad.

The number of monitoring sites and the parameters not meeting general requirements for surface water quality under the Regulation 269/2010 table 6.1.6

Sub-basin	Number of monitoring sites in sub-basin		Parameters not meeting the requirements for surface water quality under the Annex 1	
	monitored	not meeting the requirements	general parameters	Hydrobiological and microbiological parameters
Morava	18	17	BOD ₅ (ATM), Ca, COD _{Cr} , N _{total} , NEL, N-NH ₄ , N-NO ₂ , N-NO ₃ , O ₂ , P _{total}	ABU _{fy} , CHL _a , KB, TKB, EK
Danube	16	14	Ca, N-NO ₂ , O ₂ , AOX	EK
Váh	86	66	BOD ₅ (ATM), Ca, COD _{Cr} , N _{total} , NEL, N-NH ₄ , N-NO ₂ , N-NO ₃ , O ₂ , P _{total} , Cl ⁻ , AOX, pH, t	ABU _{fy} , CHL _a , KB, TKB, EK
Hron	25	21	BOD ₅ (ATM), Ca, EK (conductivity), COD _{Cr} , N _{total} , NEL, N-NH ₄ , N-NO ₂ , N-NO ₃ , O ₂ , P _{total} , pH	ABU _{fy} , CHL _a , EK

Sub-basin	Number of monitoring sites in sub-basin		Parameters not meeting the requirements for surface water quality under the Annex 1	
	monitored	not meeting the requirements	general parameters	Hydrobiological and microbiological parameters
Ipeľ	19	16	AOX, BOD ₅ (ATM), Ca, COD _{Cr} , N _{total} , N-NH ₄ , N-NO ₂ , N-NO ₃ , O ₂ , P _{total} , S ₂₋	ABU _{fy}
Slaná	12	10	N-NO ₂ , CHSK _{Cr} , AOX, NEL	EK, TKB
Bodrog	34	29	N-NH ₄ , N-NO ₂ , N-NO ₃ , Ca, COD _{Cr} , AOX, Mn, P _{total} , O ₂ , Fe, FN, EK (conductivity)	ABU _{fy} , CHL _a , KB, TKB, EK, Si _{bios}
Hornád	18	14	N-NO ₂ , N-NO ₃ , Ca, COD _{Cr} , AOX, SO ₄ ²⁻ , EK (conductivity)	EK, TKB
Bodva	6	4	N-NO ₂ , Ca, COD _{Cr}	EK, TKB
Dunajec and Poprad	10	6	N-NO ₂	KB, TKB

6.2 River Basin Districts

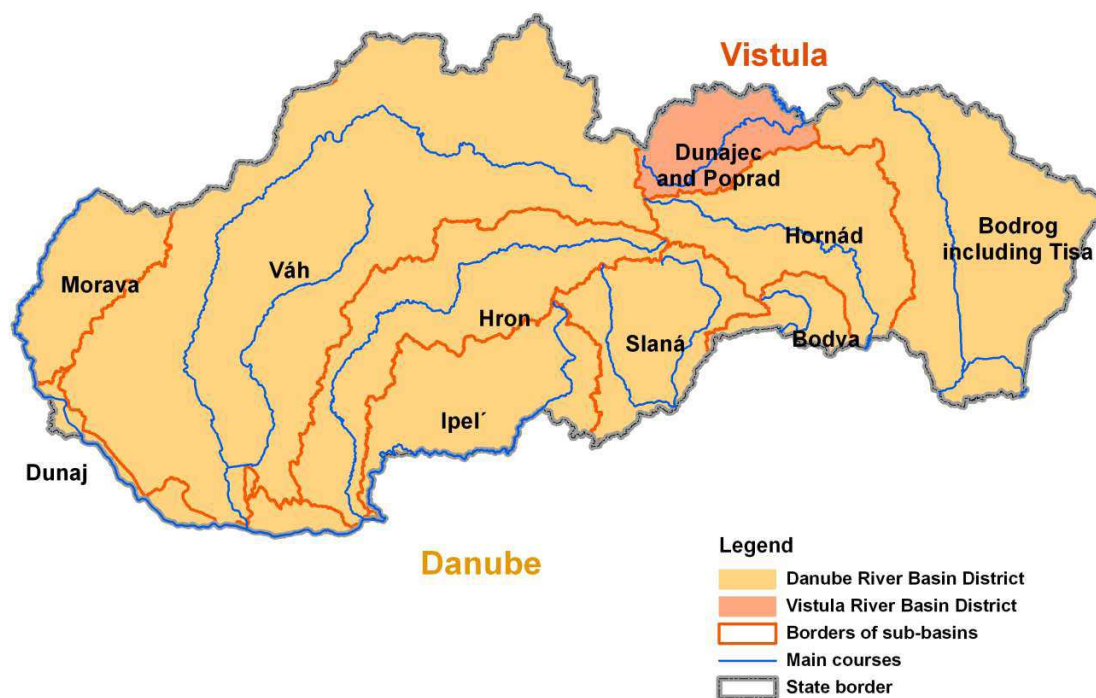
The territory of Slovakia is a part of the Danube and Vistula river basins. The river basins include the sub-basins defined according to natural hydrological boundaries and related groundwater zones.

Division of Water Resources

Water resources of Slovakia are divided in accordance with the Article 3 of the WFD as follows:

International river basin	River basin district	Sub-basin
Danube (96 % of the Slovak territory)	Danube (Black Sea drainage area)	Danube, Morava, Váh, Hron, Ipeľ, Slaná, Bodrog, Hornád and Bodva
Vistula (4 % of the Slovak territory)	Vistula (Baltic Sea drainage area)	Dunajec and Poprad

River basin districts of the Slovak Republic and their sub-basins



Source: Ministry of Environment SR, Draft of the River Basin Management Plan

Each sub-basin comprises related groundwater zones. The list of groundwater zones is included in the amendment to the Regulation of the Ministry of Environment SR 224/2005 specifying the details on identification of river basin districts, environmental objectives and water planning. The regulation is currently in the process of approval.

Management of River Basin Districts

The Danube and Vistula river basin districts are managed by the Slovak Water Management Enterprise as the administrator of important rivers in Slovakia. The Ministry of Environment SR is a competent authority to manage the river basin districts.

Water Bodies

There are 1,760 surface water bodies in the total length of 19,046.2 km identified within the river basin districts. Out of this number 1,737 water bodies are identified as natural streams while 23 bodies are categorized as lakes (because of impounding the category was changed from river to lake). The Danube river basin district includes 53 heavily modified water bodies and 7 artificial water bodies. These water bodies are categorized as bodies with bad ecological status due to hydromorphological changes caused by anthropogenic activity and they failed to achieve good ecological status. It is possible to achieve good ecological potential for these bodies and extend the period for its achievement in accordance with the WFD.

Considering groundwater resources, there are 101 groundwater bodies identified in Slovakia including 16 bodies in Quaternary sediments, 59 bodies in pre-Quaternary sediments and 26 bodies of geothermal water – structures. Six of them is identified as transboundary groundwater resources between Slovakia and Hungary. 31 water bodies are identified as groundwater bodies related to water and terrestrial

ecosystems where 16 groundwater bodies is found in Quaternary sediments and 15 in pre-Quaternary rock structures.

The list of surface water and groundwater bodies including maps are contained in the Annex of the Water Plan of Slovakia and river basin management plans available on the website: <http://www.vuvh.sk/rsv2>.

6.3 Protected Areas

In 2009, several modifications were made within the regular updating of the Register of Protected Areas in accordance with the Article 6, WFD:

o *Protected areas with bathing waters*

The number of localities with bathing water decreased by 2 (Zelená voda – Kurinec a Tona) compared to 2008. There are currently identified 36 bathing localities in Slovakia.

o *Protected areas for conservation of animal and plant species and their habitats*

– *Protected Bird Areas*

Out of 38 protected bird areas included in the National List of Protected Bird Areas in accordance with the Decision of the Government of the Slovak Republic No. 636 of July 9, 2003, 26 of them is designated under the legal regulations establishing the boundaries of protected areas and the list of activities having adverse effect on bird habitats in the relevant areas.

Out this number, the designation of 5 protected bird areas – Strážovské vrchy, Dubnica gravel pit, Senianske rybníky (fishponds), Laborecká vrchovina and Muránska planina–Stolica entered into effect on September 17, 2009.

Slovakia is obliged under the Directive on habitats to declare the areas of European importance in accordance with the National List of Protected Areas (approved by the Slovak Government and EC). The National List includes 381 areas where 174 areas are declared.

No modifications were made to other categories of protected areas.

Updated list of protected areas included in the register is shown in the table 6.3.1.

table 6.3.1

Protected area category	number of protected areas	Area (km ²)
Protected areas of international importance		
Protected areas intended for drinking water abstraction		
- protection zones of water supply resources	1,350	8,617
- protected water management areas	10	6,942
Bathing waters	36	-
Protected areas sensitive to nutrients		
- sensitive areas (whole territory of Slovakia)	1	49,041
- vulnerable areas	1,520	13,685
Protected areas for conservation of animal and plant species and their habitats		
- Wetlands of international importance - „RAMSAR“	14	408
- Protected bird areas	33	8,431.75
- Areas of European importance	381	5,737

Protected area category	number of protected areas	Area (km ²)
- Large protected areas:	23	10,727
- National parks	9	2,936
- protection zones of national parks	9	2,323
- Protected landscape areas	14	5,468
Protected areas of national importance		
Protected areas intended for drinking water abstraction		
- water supply streams (catchments)	102	5,423
Protected areas for conservation of animal and plant species and their habitats		
- Wetlands of national importance	72	74.30
- Small protected areas:	1,070	1,041
- dependent on water	312	-
- Protected fishing areas	29	-

7 WATER USE

7.1 Water Use in Water Bodies

7.1.1 Surface Water

Service Water Supply

The water tariff is 0.083317 € per m³ of surface water in accordance with the Decision of the Office for Regulation of Network Industries of October 24, 2008. Water used for irrigation in agriculture is free of charge (since July 1, 2004).

Charged water supply from surface resources in Slovakia has been experiencing downward trend since 1990. In 2009, the volume of supplied surface water was 261,923 thousand m³ in the amount 21,822,078 €. This exceeds the planned volume by 7,330 thousand m³ in the amount of 734,396 €. A decrease in water supply by 33,997 thousand m³ was recorded, i.e. by 1.15 % compared to 2008.

A drop in water supply was recorded in all SWME branches. Water supply for public water supply systems decreased by 1,290 thousand m³ compared to 2008. Significant decrease by 32,424 thousand m³ was observed in surface water supply for industry. On the contrary the agriculture experienced only slight decrease in water supply by 283 thousand m³.

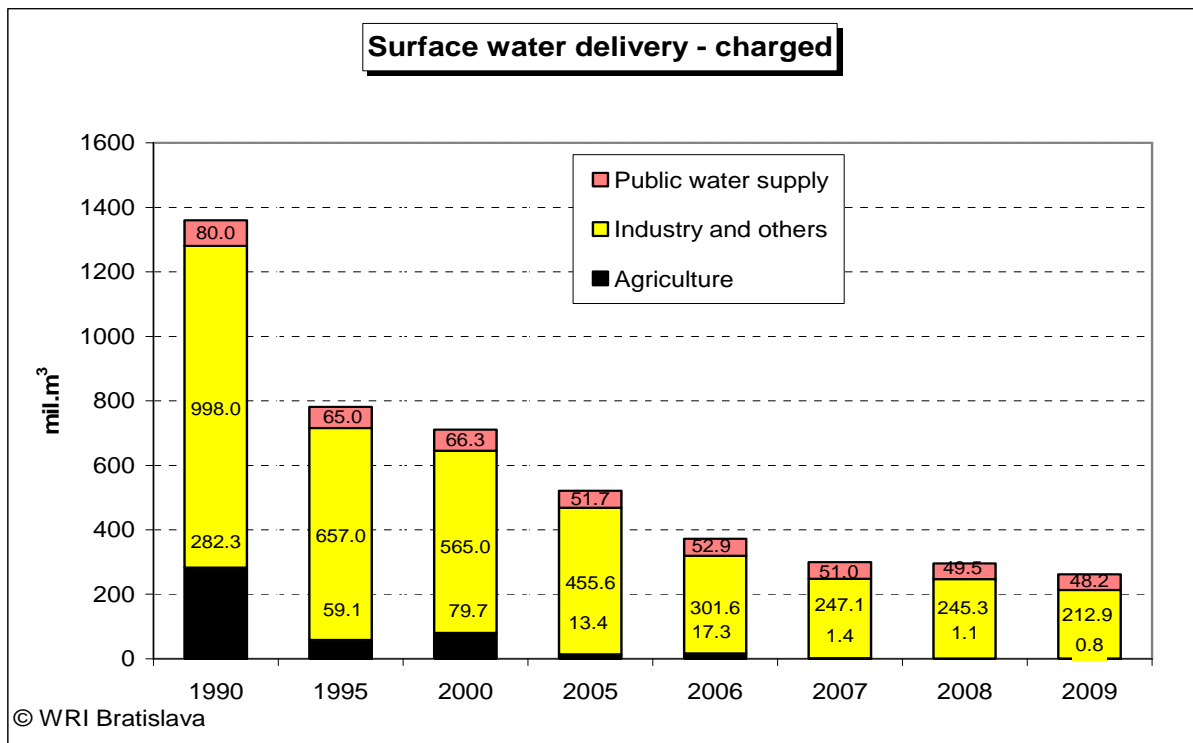
The biggest consumer of surface water for industry is Slovenské elektrárne, a. s. (power sector). It used 53,210 thousand m³ of surface water per year in the amount of 4,433,269 €. The second biggest consumer is Slovnaft, a. s. which used 49,183 thousand m³ of surface water in the amount 4,097,789 €.

Surface water supply (charged) [thousand m³]

table 7.1.1.1

	Bratislava Branch	Piešťany Branch	Banská Bystrica Branch	Košice Branch	SWME Total
Surface water supply (total):	61,142	85,081	47,441	68,259	261,923
thereof: public water supply	0	11,047	12,087	25,077	48,211
industry and others	61,142	73,266	35,341	43,182	212,931
agriculture	0	768	13	0	781

figure 7.1.1.1



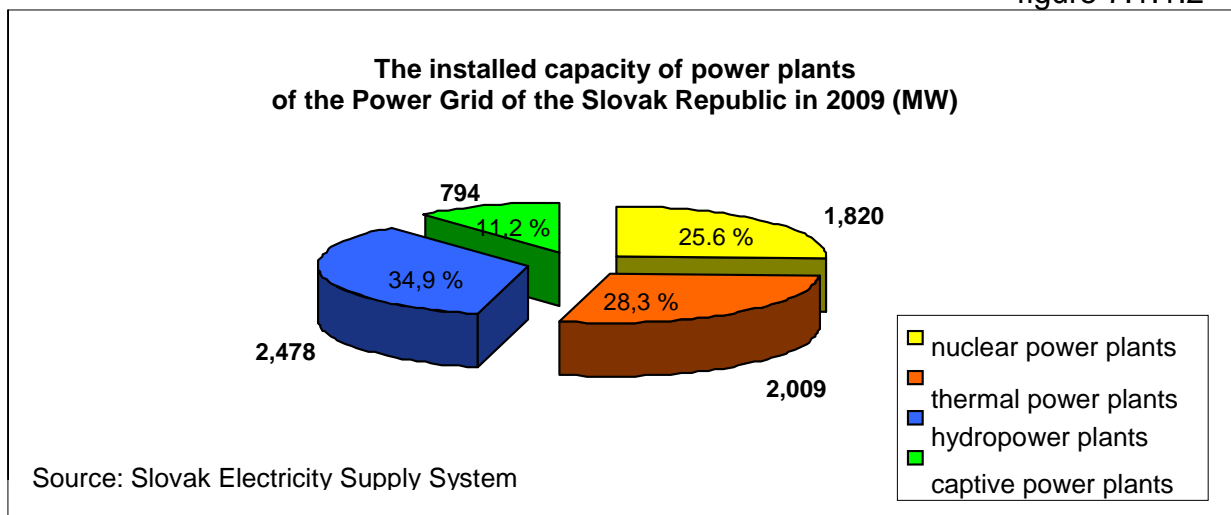
Hydropower Potential

The current state of the use of hydropower potential of watercourses for the power production is stagnant in Slovakia.

In 2009, the Power Grid of the Slovak Republic (PG SR) continued working within European system UCTE. According to the data of the Slovak Electricity Supply System (SESS) for the year 2009 the Slovak Republic did not cover the consumption of electric energy from domestic sources. The country consumed totally 27,386 GWh and the domestic production was 26,074 GWh. A decrease in power consumption is due to economic crisis.

The installed capacity of power plants of the Power Grid of the Slovak Republic was 7,101 MW in 2009:

figure 7.1.1.2



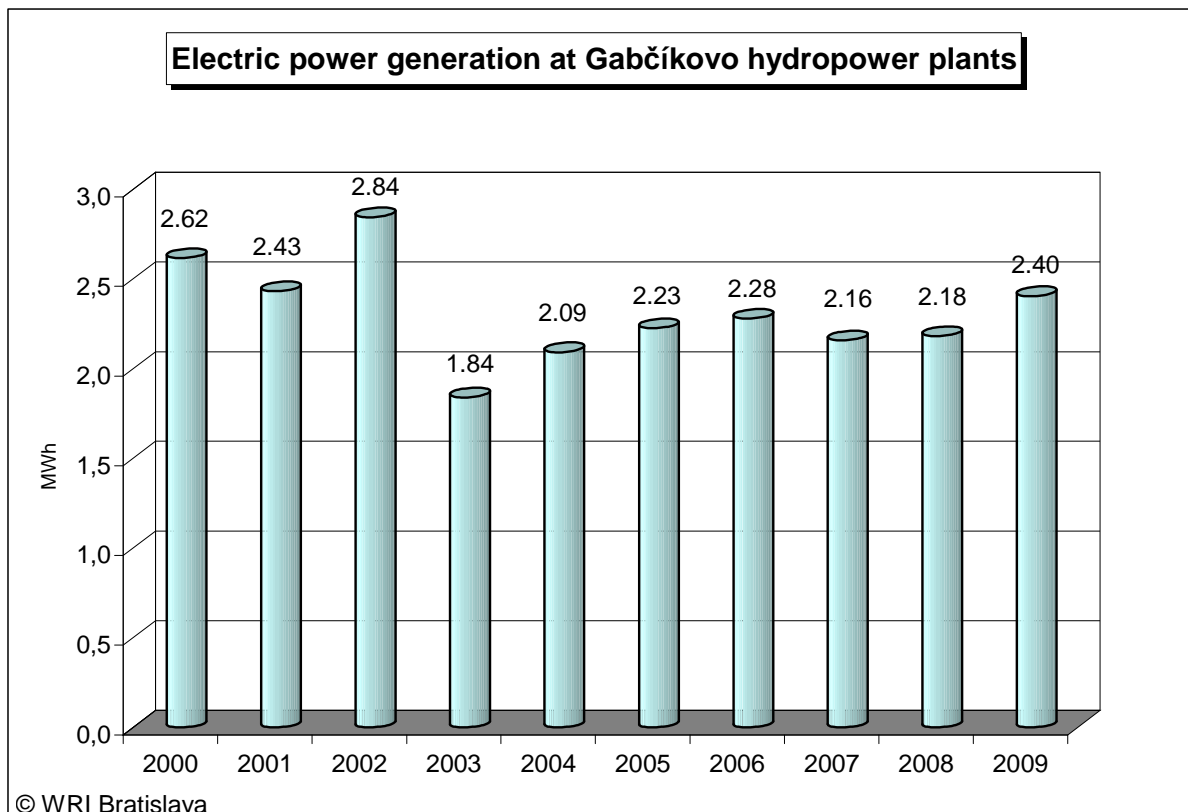
The share of sources covering annual consumption of the Power Grid of the Slovak Republic is follows: nuclear power plants 51.4 %, fossil fuel power plants 17.4 %, hydropower plants 17.0 % and industrial plants 9.4 %.The power production in hydropower plants was influenced by hydrological conditions and reached the value 4,662 GWh which is roughly the same amount as in 2008 (4,284 GW).

The operation of all water management and power structures of the Gabčíkovo Waterworks was provided by the Water Management Construction Company. The Gabčíkovo Hydropower Plant produced 2,404,911 MWh of electric power and supplied 2,376,476 MWh in 2009:

Parameter	2007	2008	2009
Power production in MWh	2,158,532	2,182,507	2,404,911
Power supply MWh	2,131,542	2,154,877	2,376,476

An overview of the power production of the Gabčíkovo Hydropower Plant for the period 2000 – 2009 is shown in the figure 7.1.1.3

figure 7.1.1.3



The Hydropower plant Žilina produced 154,490 MWh and supplied 153,286 MWh of electric power into the power grid in 2009. The increase in production was by 10,919 MWh compared to 2008.

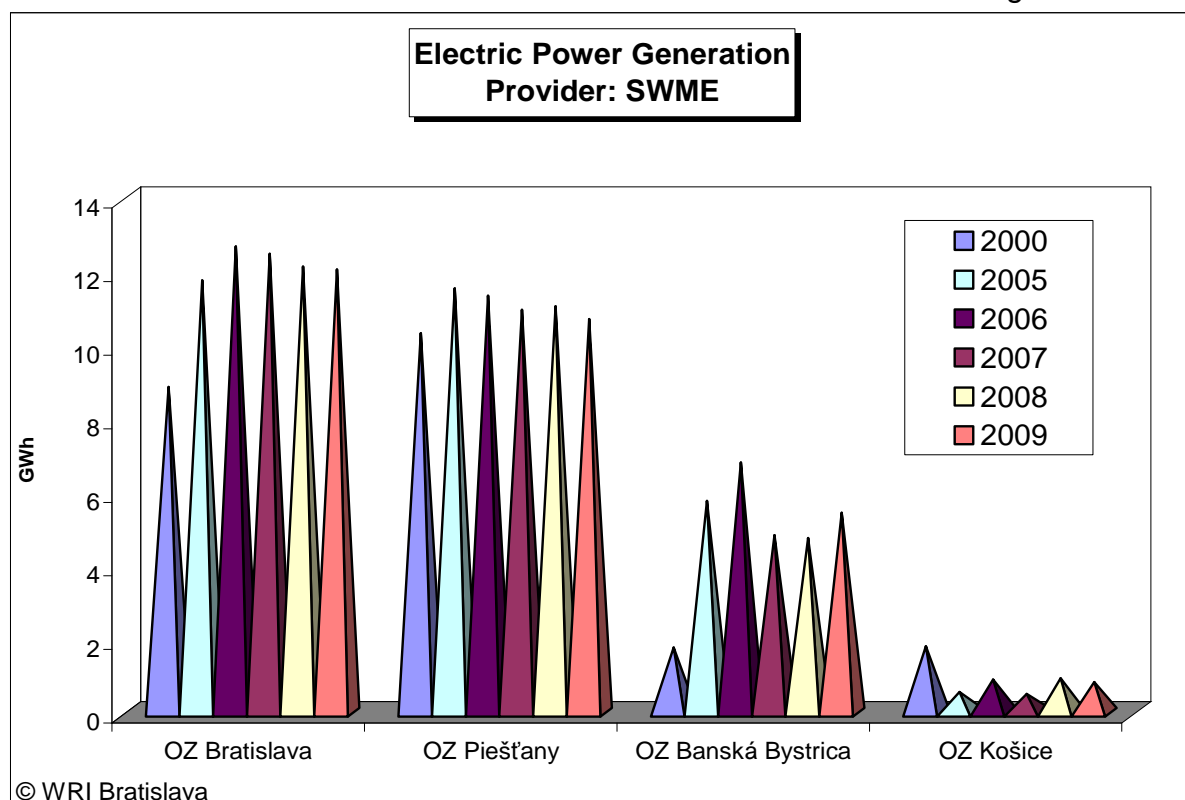
Individual organizational units of the Slovak Water Management Enterprise operating small hydropower plants (SHP) produced 29.004 GWh of electric power in 2009. It is the increase in production by 0.161 GWh compared to 2008.

A part of produced electric power was used in production facilities and operational premises of the Slovak Water Management Enterprise. The rest was supplied into the public power grid. A detailed overview of produced electric power in the years 2003 – 2009, installed capacity and the number of small hydropower plants (SHP) in 2009 managed by the Slovak Water Management Enterprise is shown in the table 7.1.1.2 and figure 7.1.1.4.

table 7.1.1.2

SWME organizational unit	Number of SHPs	Production of electric power [GWh]						
		2009	2003	2004	2005	2006	2007	2008
Bratislava Branch	5	12.46	12.26	11.75	12.669	12.477	12.123	12.044
Piešťany Branch	12	11.05	12.03	11.53	11.332	10.947	11.047	10.701
Banská Bystrica Branch	12	5.06	6.11	5.75	6.793	4.824	4.740	5.430
Košice Branch	3	1.65	0.57	0.55	0.891	0.507	0.933	0.829
SWME Total	32	30.22	30.98	29.58	31.685	28.755	28.843	29.004

figure 7.1.1.4



Irrigation Systems

The irrigation systems are constructed on an agricultural land covering 321 thousand ha. The systems include 441 irrigation networks and 487 pumping stations.

The drainage systems on the area of 450 thousand ha of agricultural land were built within the system for the regulation of water regime on agricultural land.

Hydromelioration Bratislava - state enterprise has been managing the main amelioration facilities and equipment for irrigation and drainage since July 7, 2003.

The irrigation technical systems are used in a form of renting the systems for agro-entrepreneurs and other competent entities in accordance with the decisions of the Ministry of Agriculture changing the pattern of operating and using the irrigation systems

The rented irrigation systems as of November 30, 2009:

Region	Area (in hectares)	Number of irrigation systems	Leasing Contracts
Záhorie	12,534	15	12
Podunajsko	62,064	70	51
Dolné Považie	56,175	53	45
Horné Považie	35,961	37	25
Ponitrie	9,035	24	19
Pohronie and Poiplie	21,091	24	14
Bodrog and Hornád	17,466	14	11
Total	214,326	237	177

Water used for irrigation per region:

Region	Volume (thousand m ³)
Záhorie	1,195
Podunajsko	2,912
Dolné Považie	5,084
Horné Považie	2,273
Ponitrie	355
Pohronie and Poiplie	2,136
Bodrog and Hornád	51
Total	14,006

The number of entities renting the irrigation systems is significantly reduced due to expensive operation and high tariffs for irrigation water. This impact is obvious

considering the fact that out of the total area of 214 thousand hectares of the land with installed irrigation systems only 34 thousand hectares were irrigated (15.76 % of rented land).

It is very expensive to operate and maintain the irrigation systems and related technical equipment. Concerning the cost-effectiveness of the operation of irrigation systems it would be favourable to reduce the use of these systems in case of ideal amount and time distribution of precipitation during the year.

The funds for maintenance and operation of irrigation systems, related technical equipment and facilities were granted in the amount of 994,879 € under the contract in accordance with the Decree of the Ministry of Agriculture 3703/2005 -100. These funds were used for maintenance and repair of hydro-melioration property of the state. The funds for investments were not granted.

Waterways

The main activities of the Slovak Water Management Enterprise were focused on monitored international waterway of the Danube River subject to the AGN regime (European Agreement on Main Inland Waterways of International Importance) with aim to meet the recommendations of the Danube Commission for the required parameters of the waterway (water way gabarit).

River regulation, channel training and waterway marking were carried out on the national monitored waterway of international importance in the section of the Váh River from the Danube mouth to the point where Small Danube flows into the Váh River in Kolárovo.

The boats marking the waterways sailed 16 964 km on the Danube River. The costs for marking out the waterway of the Danube and Váh rivers were in the amount of 545,140 €.

The Morava waterway is monitored up to 6.000 river kilometre belonging to the category with required parameters of the Danube River. Then up to the border with the Czech Republic it is a perspective monitored waterway currently used for sport and recreational navigation.

The Small Danube River is a not monitored waterway used for sport and recreational purpose. The maintenance of flood and navigation passability as well as marking of navigation barriers such as small-scale hydropower plants, bridges, footbridges, etc. were carried out on this waterway.

The section of the Hron River from Polomka to Kamenný Most is used for sport activities

Pursuant to the Regulation of the Regional Office Košice no. 1/2003 on training the rivers for combustion engine driven vessels, the Bodrog River in the section from the state border with Hungary up to the confluence of the Latorica River and Ondava River is included in the category of waterways. Marking of the navigation channel in this section is not currently provided by the administrator. In 2009, the Slovak Water Management Enterprise provided the development of navigation map of the Zemplín waterway in the river sections of Bodrog, Latorica and Laborec. The SWME – Košice Branch provides the marking of navigation channel in related section of the Bodrog River.

The SWME operates the waterways of water reservoirs Veľká Domaša, Zemplínska Šírava and Ružín I. where marking of navigation channels is carried out together with regular monitoring and maintenance during the navigation season.

Special-Purpose Fish Management

The following water reservoirs were used for the special-purpose fish management within the Slovak Water Management Enterprise:

- Turček and Nová Bystrica (SWME - Piešťany Branch)
- Hriňová, Klenovec, Málinec and Rozgrund SWME -Banská Bystrica Branch)
- Bukovec and Starina (SWME – Košice Branch)

Also in 2009 there were implemented relevant fish management measures in the water reservoirs important for meeting the requirements related to the special-purpose fish management. The measures were aimed at water quality improvement.

The fish planting in the water reservoirs and their tributaries was focused on brook trout, rainbow trout, brook char, pike, perch and huchen (Danube salmon). The fish planting in the water reservoirs Hriňová, Málinec, Klenovec and Rozgrund was done through own fish farming in these reservoirs.

Total costs for fish planting in water reservoirs were in the amount of 19,575 € in 2009.

The presence of natural fish predators was observed in water reservoirs of Slovakia. The European otter is regularly observed during the winter season in the fish farming facility of the Hriňová water reservoir. Other predators occurring at almost all water reservoirs are grey heron, black stork and sporadically also great cormorant.

7.1.2 Groundwater

Groundwater, as one of the important natural resources, represents invaluable, easily available and the most appropriate drinking water resource from the quantitative, qualitative and economic viewpoints. Sufficient supplies, better quality, low treatment costs and potentially low risk of contamination make groundwater a dominant resource of drinking water in Slovakia.

The assessment of relationships between potential available groundwater quantity and used groundwater quantity is carried out through the annual water management balance developed by the Slovak Hydrometeorological Institute.

The basic evaluation unit of groundwater balance is a groundwater zone with its subsequent categorization into sub-zones. In accordance with the approved hydro-geological zoning (1995) the territory of Slovakia is divided into 141 groundwater zones.

Groundwater Resources

According to the data of the Water Management Balance, the natural resources of Slovakia are $149.5 \text{ m}^3 \cdot \text{s}^{-1}$ on average including available groundwater resources of $78,556.81 \text{ l} \cdot \text{s}^{-1}$, i.e. more than 52 % of natural resources. The Committee for the Assessment of the Reports on Available Groundwater and Thermal Water Resources of the Ministry of Environment approved $47,568.57 \text{ l} \cdot \text{s}^{-1}$ that is 60.55 % of available groundwater resources and 31.8 % of natural groundwater resources.

The total available groundwater resources represents the sum of available supplies approved and supplies not approved by the Committee. The groundwater supplies are determined based on the data on quantity documented through the hydro-geological research and surveys.

Total available groundwater resources as of December 31, 2009:	
- approved by the Committee	47,568.57 l.s ⁻¹
- not approved by the Committee	30,988.24 l.s ⁻¹
Total	78,556.81 l.s ⁻¹

Compared to the previous year, the increase in available groundwater resources by 1,477.31 l.s⁻¹ (by 1.92 %) was recorded in 2009. The increase of approved available groundwater resources was 3.81 % (difference by 1,744.34 l.s⁻¹). On the contrary other available groundwater resources experienced the decrease by 0.85 % (by 267.03 l.s⁻¹) mainly due to the transfer of a part of not approved resources to the category of approved ones. A majority of available resources (more than 59 %) is represented by available resources approved by the Committee.

Based on the documented available groundwater resources it can be stated that the current and expected water demand is well assured.

Groundwater Use

Groundwater is preferentially intended for drinking water supply under the Water Act -Article 3, Paragraph 4.

Groundwater abstraction has been following the downward trends in Slovakia since 1990. In 2009, the consumers used 11,044.6 l.s⁻¹ of groundwater that is less by 77.5 l.s⁻¹ (0.7 %) compared to 2008.

The data on groundwater abstraction are included in the SHMI Water Abstraction Register. The data are provided by the consumers under the responsibilities in accordance with the Water Act and the Regulation of the Ministry of Environment. 221/2005. The register included 5,221 water resources in 2009.

The use of groundwater resources increased mainly in public water supply. On the contrary the use of groundwater decreased in other industries.

Groundwater Balance

Groundwater management balance deals with the relationship between available groundwater resources and water requirements in the related year. It is an indicator of the water resources use rate (optimum use) by expressing the balance status.

Following the results of the water management balance in 2009, 124 groundwater zones were in good balance condition, 16 zones were in satisfactory balance condition and 1 zone was in critical balance condition out of the total number of 141 groundwater zones in the Slovak Republic. It is necessary to say that the critical or emergency balance condition was observed mainly in some significant water supply localities within the groundwater zones with good or satisfactory balance status. This refers to improper and excessive use of groundwater resources.

Generally, it can be stated that there is a consistent trend of improving the groundwater balance condition in Slovakia as a consequence of the decrease in groundwater abstraction and increase in available groundwater resources.

Groundwater Quality

The monitoring of ground water quality is a systematic monitoring and assessment of ground water quality and quantity in accordance with the requirements of the Ministry of Environment of the Slovak Republic.

The Water Quality and Quantity Monitoring Programme for 2009 was developed in accordance with the strategy for implementation of the Water Framework Directive in the Slovak Republic. This document includes the requirements for collecting all important information on water quality and quantity to be reported to the European Commission.

Since 2007 the territory has been divided according to boundaries of the groundwater bodies. Monitoring of ground water chemical status was categorized into the following:

- basic monitoring
- operational monitoring.

In 2009, the ground water quality was monitored in 136 sites of the basic monitoring. These sites are included in the national monitoring network of the Slovak Hydro-meteorological Institute or they are the springs not affected by point sources of pollution. Groundwater samples were taken once a year in 1 quaternary site, twice a year in 40 quaternary sites, once a year in 49 pre-quaternary sites and four times a year in 46 pre-quaternary karst sites.

Operational monitoring was done in all groundwater bodies that were assessed as being at risk due to failing to achieve good chemical status. 298 sites were monitored within the operational monitoring programme where potential infiltration of pollution into the groundwater from potential source/sources of pollution is expected. The samples were taken 1 - 4 times a year in spring and autumn when the extreme condition of groundwater could be monitored. The region of Žitný ostrov represents a separate part of the SHMI monitoring network as it plays an important role in the whole process of monitoring of changes in water quality in Slovakia since this region is the most significant drinking water resource in our territory. The monitoring network was extended by 34 piezometric multi-layer wells (84 layers) that are monitored 2 – 4 times a year. The pollution caused by nitrogen substances was monitored at 116 sites in vulnerable areas of Slovakia within the operational monitoring in order to meet the requirements under the Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources.

The results of laboratory analyses were assessed under the Regulation of the Slovak Government 354/2006 establishing the requirements for drinking water and drinking water quality control. The assessment is performed using comparison of measured values and limit values of all analysed parameters. The results are published in the annual report “Groundwater Quality in Slovakia for 2009” and biennial report “Groundwater Quality in Žitný ostrov for 2009 - 2010”.

The recommended percentage value of water saturation by oxygen was reached in 74 % of samples within the groundwater basic monitoring sites. Measured pH values were in the range of limit values except 15 samples. Conductivity exceeded the indicating value specified in the Government Regulation 2 times out of the total number of 314 analyses.

Unfavourable oxidation-reduction conditions become an essential issue that is proved by the most frequently exceeded acceptable concentrations of the total Fe (58 times), Mn (53 times) and NH_4^{4+} (13 times). Besides these parameters, sporadic exceeding was observed in case of Cl^- , SO_4^{2-} , NO_3^- , COD_{Mn} and soluble substances at 105 °C. Increased concentrations of the following trace elements were recorded: Sb (8 times), As (6 times), Pb (5 times), Al (4 times), Ni (2 times), Hg (2 times) and Cr (1 time). The limit values for arsenic, lead and antimony were exceeded 4 times in the monitoring site 130799 Jasenie. Pollution caused by specific organic substances has only local impact. Most of specific organic substances were measured under the detection limit. No limit values were exceeded in this group. The limit for general organic substances was exceeded only for total organic carbon (3 times).

The values of acceptable concentration (defined under the Regulation of the Slovak Government 354/2006) measured in the sites of operational monitoring including the region of Žitný ostrov were exceeded for the following parameters:

- Mn and total Fe are the most frequently exceeded parameters that prove unfavourable oxidation-reduction conditions,
- the exceeded limit values of Cl^- and SO_4^{2-} indicate the impact of anthropogenic pollution on groundwater quality,
- the limits for the following basic parameters were exceeded: soluble substances at 105 °C (53 times), H_2S (19 times), Mg (7 times) and Na (5 times),
- land use pattern (agricultural lands) results in increased concentration of oxidized and reduced forms of nitrogen in groundwater - ammonium ions NH_4^+ (77 times) and NO_3^- (64 times),
- acceptable value defined under the Regulation was exceeded for 6 trace elements (Al, As, Sb, Cd, Ni and Pb); the limits for As (27 times) and Al (15 times) were exceeded most frequently,
- presence of specific organic substances in groundwater is an indicator of the impact of human activity; various specific organic substances were recorded in the sites of operational monitoring – the most frequently exceeded limits were for the following parameters: polyaromatic hydrocarbons (fluorantene, pyrene and fenantrene) and volatile aliphatic hydrocarbons (chloroethene, 1,1,2,2-tetrachloroethene); the limit values for pesticides and volatile aromatic hydrocarbons were also exceeded,
- the impact of anthropogenic activity on groundwater quality is proved by the increased concentration of COD_{Mn} (15 times); the values of hydrocarbon index UI were exceeded 12 times in case of general organic substances (12 times) and the values for TOC were exceeded 14 times.

Groundwater has a relatively low oxygen concentration proved by the fact that recommended percentage of the water saturation by oxygen was reached only in 20 % of samples. The values of conductivity exceeded the indicating value defined under the Government Regulation 33 times out of the total number of 705 measurements. The pH value was in the range of limit values except 23 samples. The purpose of the monitoring programme indicates that the monitoring sites of basic monitoring are situated in the areas not affected by human activity and, therefore, ground water show better quality in comparison with the sites of operational

monitoring designed to monitor the impact of significant sources of groundwater pollution.

7.2 Drinking Water Supply

The total number of inhabitants supplied with drinking water from public water supply network increased in 2009 compared to the previous year only by 11.2 thousand inhabitants to 4,681.6 thousand inhabitants that is 86.30 % out of the total number of population of the Slovak Republic.

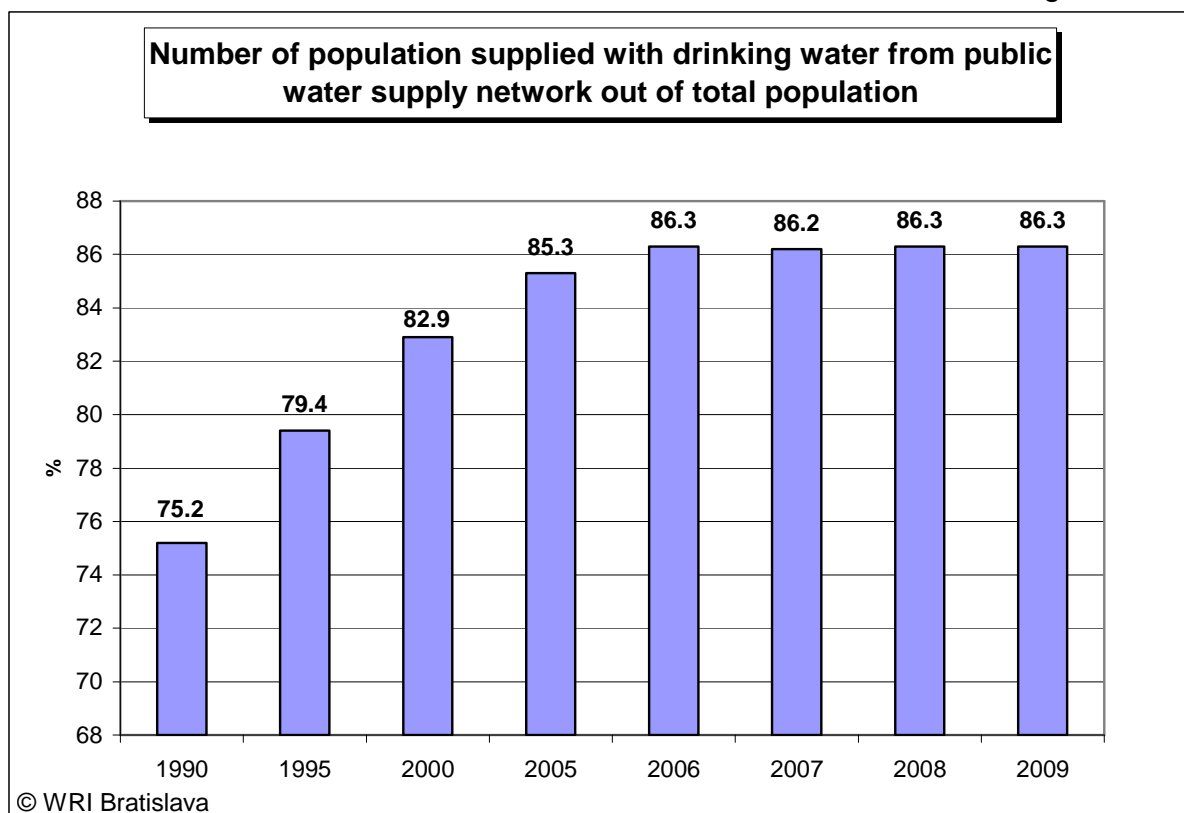
Development of the total number of inhabitants and the number of inhabitants supplied with drinking water from public water supply network administrated by water companies, local authorities and other organizations [in thous.]

table 7.2.1

	1995	2000	2005	2007	2008	2009
Total number of inhabitants	5,363.7	5,400.6	5,386.7	5,401.0	5,412.3	5,424.9
Supplied with drinking water from public water supply network	4,256.8	4,479.2	4,594.1	4,653.7	4,670.4	4,681.6
Proportion [%]	79.4	82.9	85.3	86.2	86.3	86.3

Prepared by: WRI using the data of water companies, local authorities and other organizations

figure 7.2.1



Drinking water supply and development of water supply network
administrated by water companies, local authorities and other subjects table 7.2.2

No	Indicator	Unit	Year				
			2007	2008	2009	Expectation	
						2010	2011
1	Number of inhabitants supplied from water supply network	thous.	4,653.7	4,670.4	4,681.6	4,709.3	4,719.7
2	Capacity of water resources	l.s ⁻¹	32,736.0	33,876.1	33,606.0	33,610.0	33,620.0
3	Length of water supply networks	km	26,898.7	27,377.3	27,532.0	27,854.0	28,165.0
4	Capacity of ground water resources	l.s ⁻¹	26,904.7	27,128.4	27,725.0	27,725.0	27,725.0
5	Water produced in water management facilities	mil. m ³	321.6	318.3	313.9	309.4	310.6
	of which: water produced from ground water		271.0	257.8	264.1	269.5	269.0
6	Water intended for use	mil. m ³	326.3	323.4	317.3	313.2	314.3
7	Water invoiced in total	mil. m ³	224.8	220.4	214.7	214.5	214.1
	included: for households		153.0	146.0	147.0	146.2	145.9
8	Water not invoiced	mil. m ³	101.5	103.0	102.6	98.7	100.2
	of which: water loss in pipes		87.6	88.9	88.3	85.0	87.0
9	Specific water consumption (of water invoiced in the households)	l.inhb. ⁻¹ .day ⁻¹	89.9	85.6	86.0	85.0	84.7

Prepared by: WRI using the data of water companies, local authorities and other organizations

In the facilities of water companies, local authorities and other subjects there was produced 313.9 mil. m³ of drinking water in 2009 which means the decrease by 4.1 mil. m³ compared to 2008. Compared to 1990 the amount of water intended for use was almost doubled compared to 2009.

Despite the decrease of water supply to households, specific consumption of drinking water for households slightly increased in 2009 (to 86.0 l.inhab⁻¹.day⁻¹).

The volume of not invoiced water was 102.6 mil. m³ which is 32.3 % of water intended for supply. Water loss in pipes (27.8 % of water intended for use) covers 86.1 % of this number.

Construction of public water supply network led to an increase in number of technical facilities and structures. Compared to 2008 the total length of water supply systems in Slovakia (water companies, local authorities and other subjects) increased by 154.7 km up to the total length 27,532 km.

figure 7.2.2

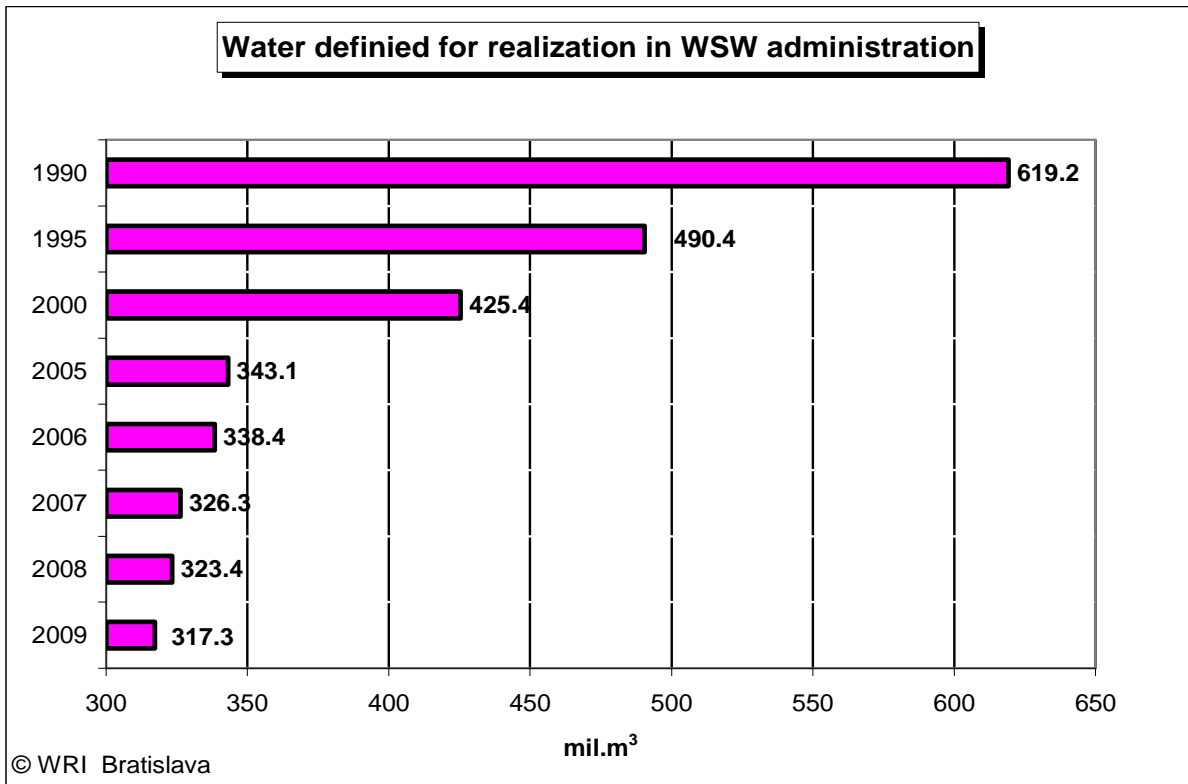
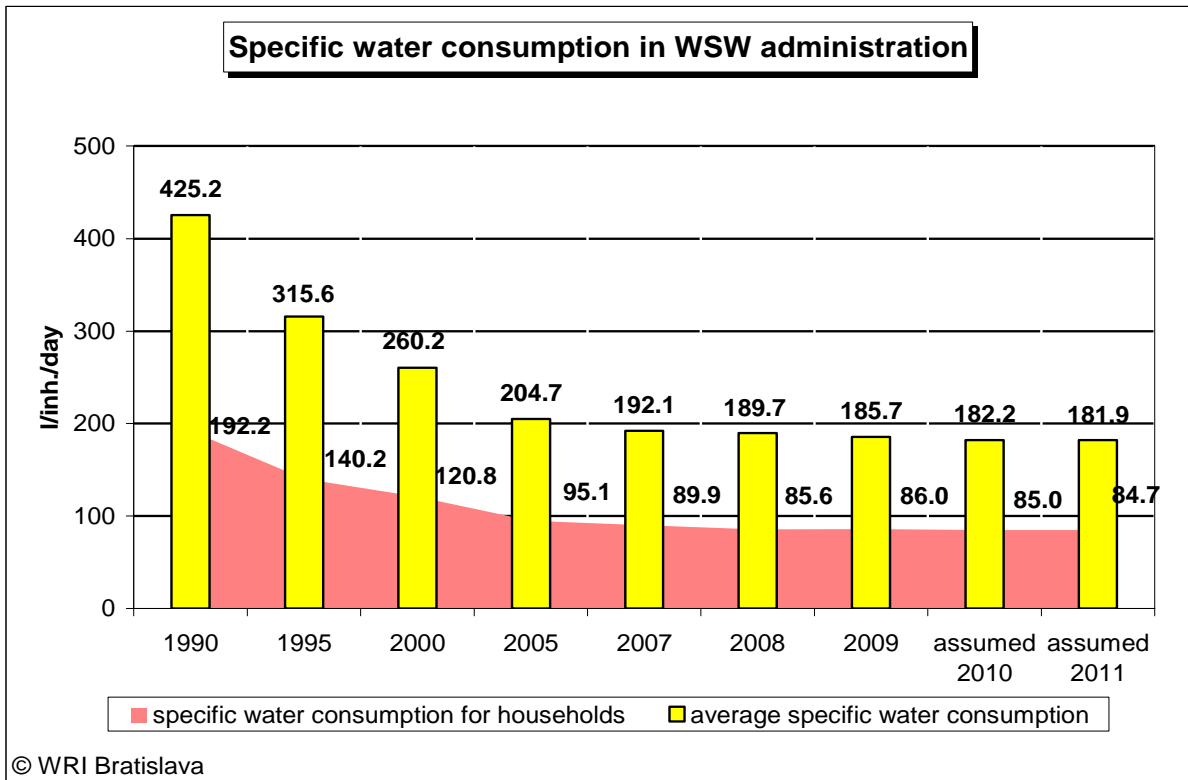


figure 7.2.3



Drinking Water Quality

Assessment of drinking water quality in public water supply systems is based on the results of the control of public water supply system operators – water companies and municipalities. Water quality is assessed on the basis of the number of determinations of individual drinking water quality parameters exceeding related hygienic limits.

In 2009 as many as 10,335 drinking water samples from sampling sites in water distribution network were analyzed in laboratories of water companies. In these laboratories 285,435 analyses were done concerning particular parameters of drinking water quality.

Parameters affecting sensory properties of drinking water were mostly determined and 100,691 analyses were performed. As many as 97,260 drinking water analyses included microbiological and biological drinking water parameters.

In 2009 the portion of drinking water analyses meeting hygienic limits reached the value 99.46 %.

Number of samples meeting the requirements for drinking water quality concerning all parameters reached the value 91.20 % in 2009.

Free chlorine parameter is not included in these numbers.

Exceeding the limit values in drinking water samples in line with the Government Regulation no. 354/2006 Coll.

on requirements for drinking water and drinking water quality control table 7.2.3

Year	2005	2006	2007	2008	2009
Amount of drinking water samples not meeting the limits with HLV	2.10 %	1.32 %	2.03 %	2.34 %	1.77 %
Amount of analyses of drinking water quality parameters not meeting the limits with LV, HLV and IV	0.55 %	0.32 %	2.46 %	1.02 %	0.88 %
Amount of analyses meeting hygienic limits (%)*	99.32 %	99.44 %	99.32 %	99.45 %	99.46 %
Amount of samples meeting the requirements for drinking water quality in all parameters (%)*	89.59 %	91.18 %	89.78 %	91.84 %	91.20 %

IV – indicating values, LV – limit values, HLV – highest limit values

* Parameter Free chlorine is not included in the amounts.

Not meeting the hygienic limits in drinking water in distribution network was mainly found out in the following parameters in 2009:

- *microbiological and biological parameters:*
Escherichia coli, coliform bacteria, Enterococci, cultivated micro-organisms at 36 °C, living micro-organisms, abioseston, Clostridium perfringens;
- *inorganic and physical-chemical parameters:*
nitrates, nitrites, absorbance, colour, manganese, sulphates, turbidity, iron;
- *radiological parameters:*
total volume activity alpha;
- *disinfectants and their by-products:*
free chlorine, chlorites.

7.3 Wastewater Collection and Treatment

Development of public sewerage system falls behind the development of public water supply network in the Slovak Republic. In 2009 the number of residents connected to public sewerage system increased by 28.4 thousand to the total number of 3,225.0 thousand inhabitants representing 59.5 % out of the total number of population.

Development of public sewerage system and volume of discharged urban wastewater through public sewerage system administrated by water companies, local authorities and other subjects is listed in the table 7.3.1 and figure 7.3.1.

Urban wastewater discharge and development of sewerage system managed by water companies, local authorities and other subjects table 7.3.1

No	Indicator	Measure	Year				
			2007	2008	2009	Expectation	
						2010	2011
1	Number of inhabitants connected to public sewerage system	tisíc	3,147.0	3,196.6	3,225.0	3,257.0	3,371.0
	of that: in houses connected to sewerage system with WWTP	tisíc	3,060.8	3,106.9	3,141.7	3,181.6	3,202.0
2	Length of sewerage networks	km	8,496.5	9,266.4	9,658.4	9,851.0	10,045.0
3	Water discharged to watercourses altogether	mil.m ³	416.1	403.5	427.1	423.8	424.7
	of that: treated wastewater	mil.m ³	407.8	395.3	417.8	414.5	415.6
4	Volume of discharged wastewater*	mil.m ³	209.0	207.0	204.7	205.0	205.0
	of that: sewerage water	mil.m ³	115.9	112.8	119.2	114.3	114.2
	industrial and other wastewater	mil.m ³	93.1	94.2	85.5	90.7	90.8

* Amount of discharged urban wastewater (water collected - charged) includes only water companies and other entities: Water and Sewage Company, Ltd., Hlohovec; Mondi SCP, Ružomberok; KOMVaK, Komárno; (without data concerning local authorities)

Source: Water Research Institute

Besides mentioned urban waste water the amount of 224.505 mil. m³ of water waster treated and not treated from industrial and agricultural production was discharged according to the SHMI data in 2009. The amount of 203.245 mil. m³ (90.5 %) was treated and the amount of 21.260 mil. m³ (9.5 %) was not treated out of the amount mentioned in the previous line. The biggest polluters are: Slovnaft, Inc., Bratislava; Bukocel, Inc., Vranov; Duslo, Inc., Šaľa; Smurfit Kappa, Inc., Štúrovo; U. S. Steel, Ltd.; Novácke Chemické Závody, Inc., Nováky; Rudné bane, state company, Spišská Nová Ves; Biotika Slovenská Ľupča; nuclear power station Jaslovské Bohunice.

figure 7.3.1

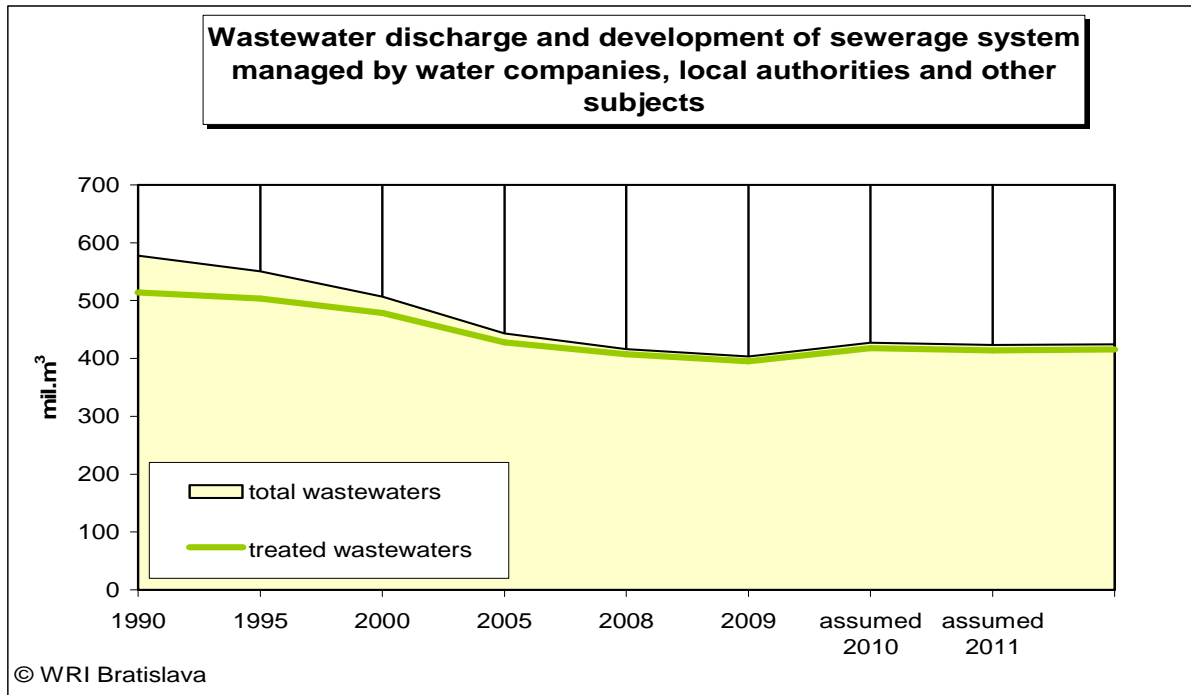
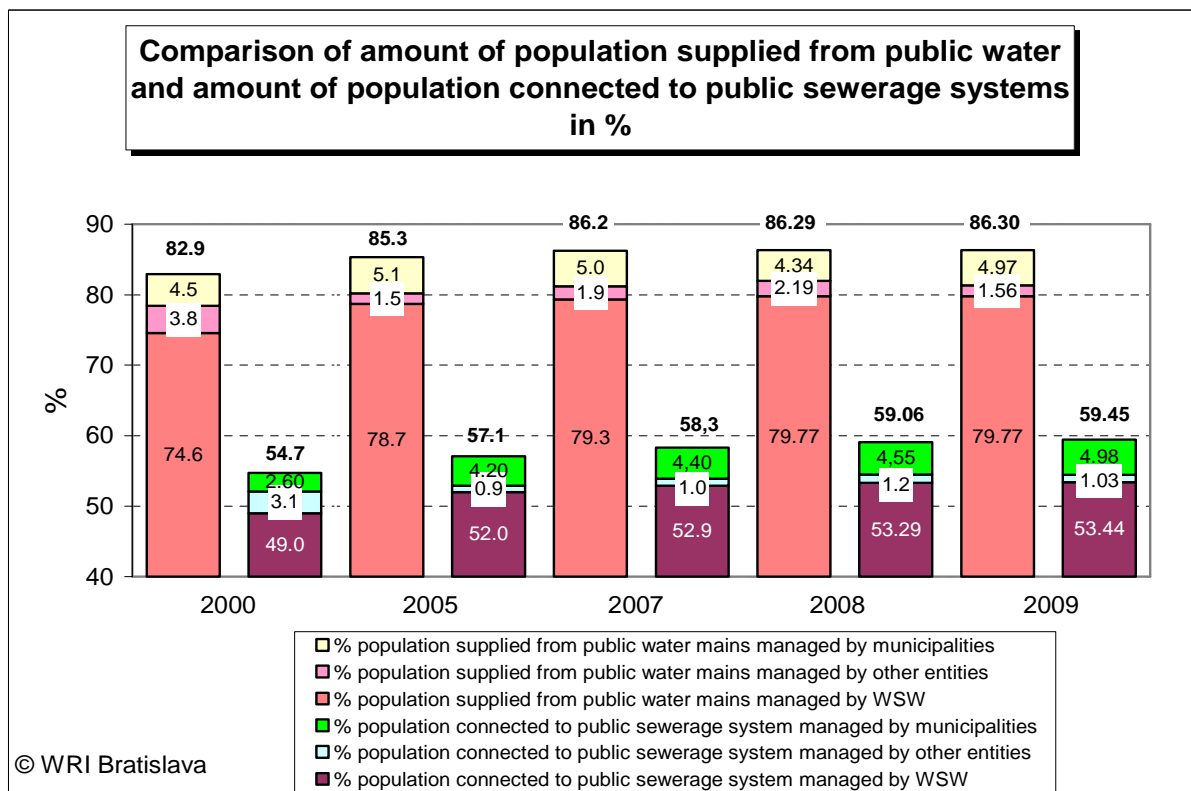


figure 7.3.2



7.4 Sewage Sludge Disposal and Production

In 2009 sludge production covered 58,582 tons of dry mass. Out of this quantity 47,056 tons (80.3 %) were used in agriculture 8,830 tons (15.1 %) were temporarily stored and 2,696 tons (4.6 %) were put at landfills. In 2009 the sewage sludge (12 tons) only from one WWTP was directly applied to agricultural land. 42,919 tons of sludge dry mass were used for production of compost and 4,125 tons of sludge for soil processes.

The overview of sewage sludge generation for WWTP and sludge disposal methods in the period from 2001 to 2009 is shown in the table 7.4.1. Data concerning the quantity of sludge applied to soil include also the sludge added to soil in a form of compost and sludge used in soil processes.

table 7.4.1

Year	Sludge production (dry mass) t/r	Of which					
		Application into soil		Temporarily stored		Put on disposal site	
		t/r	%	t/r	%	t/r	%
2001	53,350	37,855	71.0	8,493	15.9	7,002	13.1
2002	51,270	41,960	81.8	4,870	9.5	4,440	8.7
2003	54,340	39,330	72.4	6,900	12.7	8,110	14.9
2004	53,110	42,530	80.1	5,860	11.0	4,720	8.9
2005	56,360	39,120	69.4	8,710	15.5	8,530	15.1
2006	54,780	39,405	71.9	6,130	11.2	9,245	16.9
2007	55,305	42,315	76.5	9,400	17.0	3,590	6.5
2008	57,810	38,368	66.4	10,766	18.6	8,676	15.0
2009	58,582	47,056	80.3	8,830	15.1	2,696	4.6

7.5 Additional Benefits of Water Management

Restoration of Catchments and Watercourses

In 2009 restoration measures were implemented in the following areas:

- Regional centre of nature conservation in Prešov;
- Authority of the High Tatras National Park;
- Authority of Veľká Fatra National Park;
- Authority of Dunajské luhy Protected Landscape Area;
- Authority of Kysuce Protected Landscape Area;
- Authority of Poľana Protected Landscape Area;
- Authority of Ponitrie Protected Landscape Area;
- Authority of Štiavnické vrchy Protected Landscape Area;
- Authority of Vihorlat Protected Landscape Area;
- Authority of Východné Karpaty Protected Landscape Area;
- Authority of Záhorie Protected Landscape Area.

To ensure the continuity of migration routes of water animals in the Ipeľ River Basin, the construction of fish passes and restoration of dead river branches was performed in the responsibility of the Transboundary Water Committee for the Ipeľ River and on the dams Malé Kosihy and Ipeľský Sokolec.

Restoration of Natural Water Regimes

- the project LIFE „*Restoration of Wetlands in Záhorie Lowlands*“ and the project UNDP/GEF „*Protection, Restoration and Reasonable Use of Moors*“ in the Slovak Republic were finished,
- the project „*Protection of the Danube Region Birdlife*“ was approved,
- the project „*Protection of Central European Tundra Vole (Microtus oeconomus mehelyi)*“ was approved. Restoration of water regime of Čiližský Brook is planned within this project. Project „*Integration of Principles and Procedures of Ecological Management into the Landscape and Water Management Control in the East Slovak Lowland (Laborec – Uh Region)*“ was approved as well,
- cooperation with the Civic Association „*Friends of Trstianska Nature*“ when restoring the dead river branch of the Hornád River,
- the construction of impounding structure in Kláštorské lúky National Nature Reserve was carried out.

In the eastern part of Blatá Lúka (Senianske Fishponds Protected Bird Area) there are large field depressions which face the threat of gradual destruction. Within the LIFE project „*Conservation of Protected Bird Areas Senné and Medzibodrožie in Slovakia*“ these depressions were deepened in the spring 2009.

8 MONITORING AND INFORMATION SYSTEM

Monitoring System

The Slovak Hydro-meteorological Institute is responsible for the framework project named Partial Monitoring System – Water and it is charged with coordination of the project via hydrological services and implementation of monitoring programmes in accordance with related decree.

In 2009 the Partial Monitoring System – Water consisted of the following monitoring subsystems:

1. Surface Water Quantity Parameters
2. Ground Water Quantity Parameters
3. Surface Water Quality
4. Ground Water Quality
5. Thermal and Mineral Waters
6. Irrigation Waters
7. Recreational Waters

Subsystems 1 to 4 are provided by the Ministry of Environment of the Slovak Republic through the Slovak Hydro-meteorological Institute. Providing the function of the subsystems 5 Thermal and mineral waters and 7 Recreational waters are in charge of the Ministry of Health. Providing the function of the subsystem 6 Irrigation waters is within the competence of the Ministry of Agriculture.

Activities Related to Partial Monitoring System – Water for 2009

Surface Water Quantity Parameters

In 2009 the monitoring of surface water quantity parameters was done in 419 gauging stations where water status was monitored. In 404 stations the discharge was also calculated and in 415 stations the water temperature was also measured

and in 17 stations the water sampling was done and the water turbidity was evaluated (the content of suspended load in water). As many as 2,112 measurements were made for the purposes of direct discharge measurement for creation and calibration of measuring curve. On average 5.04 measurements were taken in one gauging station. Common measurements with neighbouring countries on transboundary rivers were taken as it is stated in the table 8.1 following bilateral agreements:

Common measurements at transboundary courses table 8.1

Country	Number of common profiles	Number of hydrometerings
Hungary	24	119
Austria	3	26
Czech Republic	4	32
Poland	5	35
Ukraine	2	10
Total	38	222

Source: SHMI

6 100 daily water samplings were carried out for the purpose of assessing the suspended load as well as 28 overall measurements and 166 control water samplings.

Monitoring of surface water quantity parameters was performed as planned; however, newly designed stations were not constructed (with the exception of the Turá Lúka Station – Svacenický Brook) because no financial means were allocated. The number of planned direct discharge measurements was smaller by 412 measurements comparing to the plan for technical and capacity reasons. Total number of common measurements on transboundary rivers was observed (only 2 measurements fewer). Number of daily water samplings was smaller compared to the planned number due to lack of skilled staff. Little smaller number of overall measurements was caused by technical and financial problems.

Ground Water Quantity Parameters

The extent of monitoring within the subsystem is stated in the Amendment of the Monitoring Programme for the years 2008 – 2010. In 2009 the monitoring was planned in 1,493 monitoring places. In fact the monitoring was carried out on 1,499 monitoring places. Outcomes of monitoring are stored into HIS database and into IS Oracle administrated by the SHMI. Monitoring outcomes are made available in accordance with the Act 211/2000 Coll. on Free Access to Information as Amended and they are presented through special publications – the Ground Water Hydrology Year Book and the Report on Environment.

Surface Water Quality Parameters

Performance of individual parts of the subsystem is carried out by the following organizations: SHMI, SWME and WRI. Competence of individual organizations and the extent of monitoring are described in the Amendment prepared for the year 2009 to the Water Status Monitoring Programme for the years 2008 – 2010.

In 2009 the monitoring was planned in 312 monitoring places. Outcomes of monitoring are made available in accordance with the Act 211/2000 Coll. on Free Access to Information as Amended and they are presented through special

publications – the Partial Monitoring System Year Book, the Surface Water Quality in the Slovak Republic Year Book and the Report on Environment.

Ground Water Quality Parameters

Performance of individual parts of the subsystem is carried out by the SHMI and accredited geo-analytical laboratories of the State Geological Institute of Dionýz Štúr in Spišská Nová Ves. Competence of individual organizations and the extent of monitoring are described in the Amendment prepared for the year 2009 to the Water Status Monitoring Programme for the years 2008 – 2010.

In 2009 the monitoring was planned in 554 monitoring places. In fact the monitoring was carried out on 552 monitoring places. Outcomes of monitoring are presented through special publications - Ground Water Quality in Slovakia Year Book and Ground Water Quality in Žitný Ostrov Year Book.

Thermal and Mineral Waters

Database (monitoring system) operation required to develop the software product – Information system of the Inspectorate of Spas and Springs at the Ministry of Health of the Slovak Republic. This information system is built on the basis of geographic information system and it has two versions. Monitored data at localities are collected in local information systems and then they are sent to the central information system where the data are evaluated, checked and archived.

Monitoring, evaluation and archiving of regime parameters of natural healing and natural mineral resources and observation structures under the authorization to use the source and the control of qualitative indicators of natural healing and mineral water is carried out continually at the Inspectorate of Spas and Springs.

In 2009 monitoring in Slovakia includes 45 localities out of which 36 localities provide data transfer to a central database of the Ministry of Health of the Slovak Republic through the local information system and the information from other localities are sent through MS EXCEL. In total, there are 171 objects included in monitoring system - 116 recognised resources and 55 other observation resources.

Irrigation Waters

In 2009 the Ministry of Agriculture of the Slovak Republic did not allocate any financial means for irrigation waters. To keep the monitoring continuity, a limited number of localities (20) was selected and only basic parameters were monitored to provide the information of quality at least for the biggest irrigation water consumers and those who irrigated fruit and vegetables. The task was financed only from own resources of the Soil Science and Conservation Research Institute.

Recreational Waters

Bathing water is defined in legislation as each running or standing water or its part used by bigger number of people for bathing and where bathing is allowed or it is not forbidden. In total approximately 70 natural and 150 artificial swimming pools are used in Slovakia for recreational purposes every year. Their number differs every year and it depends on weather and interest to be operated.

Monitoring outcomes are inserted into the Information System on Swimming Pools and Bathing Water Quality which is available on the website www.uvzsr.sk. This information system is administrated by the Slovak Environmental Agency. Information on monitoring is also available on the websites of regional authorities of

public health and the Public Health Authority of the Slovak Republic which are responsible for bathing water quality.

Data on bathing waters were processed in several reports and information materials in 2009. At the end of the year 2009 the recreational water issues were included in the Annual Report of regional authorities of public health in Slovakia (including swimming pools operating for the whole year).

In the 2009 bathing season there were no serious complications recorded which would harm the health of holidaymakers.

Information Systems

Environmental protection needs information including spatial data which would be available, reliable, exchangeable, shared and combined. Currently in Europe there is a big disunity caused by variety of formats and structures of spatial data. INSPIRE Directive encourages the Member States to introduce and operate their own national infrastructure.

Access of individual users from the organizations of the Ministry of Environment of the Slovak Republic to geospatial data from data store was provided within the task the Environmental Infrastructure of Spatial Data. Two types of the access to data store are available. The first type is browsing and downloading the geospatial data to local computer. The second type also enables data editing directly in data store.

The Catalogue of Environmental Objects offers the basic foundation for the systematic development of governmental infrastructure, as well as non-governmental data.

More information about the directive can be found at the following websites: <http://inspire.jrc.ec.europa.eu/> a <http://www.sazp.sk/inspire/>.

EnviroInfo (meta-informational system) is internet database application available to the general public at the website <http://enviroinfo.enviroportal.sk>. The effort of this meta-informational system is to provide automated meta data collection.

Currently the up-grade of EnviroInfo is carried out and it is focused on separating the spatial data in EnviroInfo from non-spatial data – mostly documents.

Informational System of Environmental Authorities (www.sazp.sk/isuzp) – has 2 main subsystems (Administration and Economy) and 7 specialised subsystems of Air, Water, Waste, Nature, Effects, Accidents and IPPC (Integrated Information System of Pollution Prevention and Control).

A part of several information systems is also GIS module which contains geographic illustration of a situation, phenomenon, operation or action on the map.

Construction of the e-Government means electronic processing of requests and permissions related to the environment. Currently environmental regional and district authorities make contact and basic environmental information available at their websites www.kuzp.sk.

Reporting duties to the European Commission are currently carried out using electronic tools through *WISE - Water Information System for Europe*.

Access to information on the environment is provided by the Enviroportal (www.enviroportal.sk). It is a place where the outcomes of individual information systems meet.

9 RISK FACTORS OF WATER MANAGEMENT, CAUSES AND CONSEQUENCES

9.1 Floods

The month June was really dramatic from the viewpoint of flood occurrence and announcing the degrees of flood activity. Floods were on the rivers Myjava, Teplica, Brezovsky potok and their tributaries. In the last decade of June a strong storm activity accompanied by heavy rain affected the territory in the north of East Slovakia, mainly districts Humenné, Svidník, Bardejov and Kežmarok.

The Consequences of Floods in 2009

The total costs and damage caused by floods in 2009 (table 9.1.1 and figure 9.1.1) were quantified at 11.309 million €, of which the costs of flood safety works were estimated at 1.591 million € and the costs of flood rescue operations at 1.301 million €.

Damage to property was amounted to 8.417 mil. € including damage to property of state in amount of 2.480 mil. €, damage to property of residents in amount of 1.693 mil. €, property of municipalities in amount of 2.948 mil. € and property of higher territorial units in amount of 0.425 mil. €. Damage to property of other entities was amounted to 0.868 mil. €.

In total, the floods affected 165 villages and towns. Floods damaged 929.2 km of water supply system; 643 km of sewerage system; 37.2 km of river embankments, 688.05 km of dikes and 39 step and cascades weirs. Floods affected 6,998 residents out of which 271 had to be evacuated.

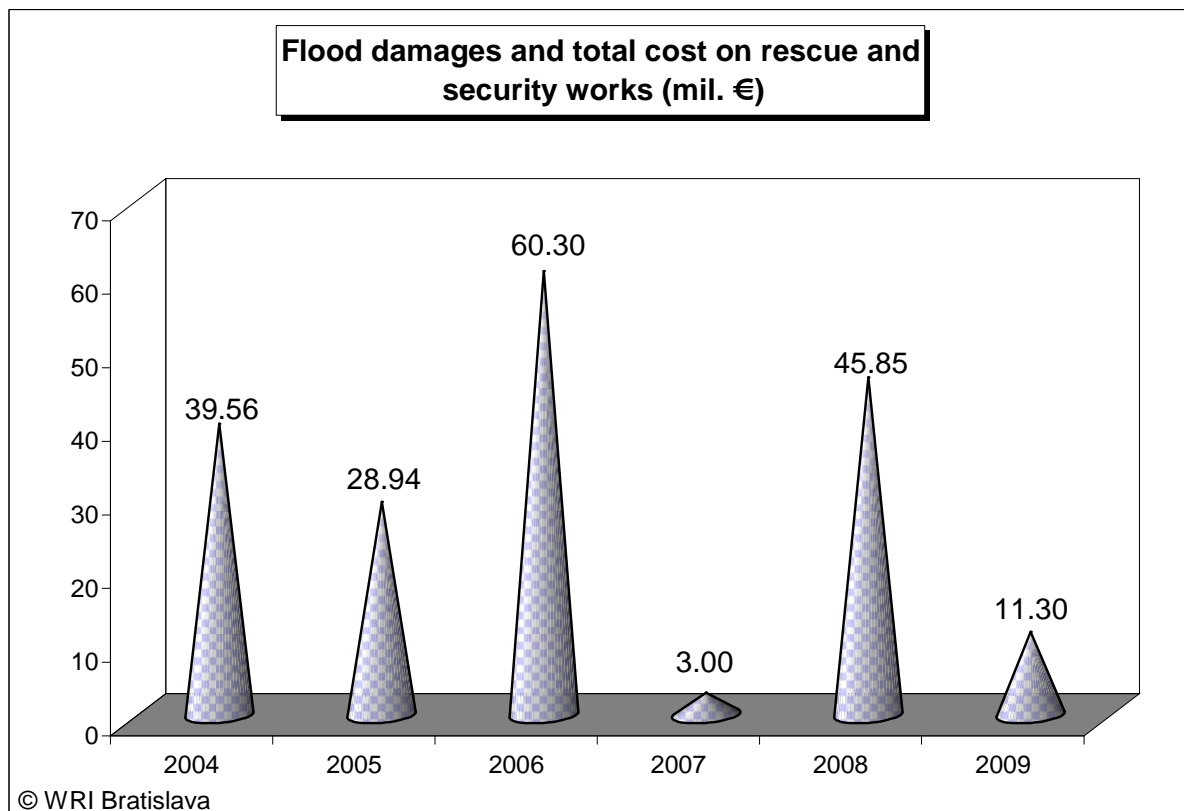
Financial consequences of floods in 2004 - 2009

table 9. 1. 1

Floods - year	Number of municipalities affected by floods	Flooded areas in hectares	Flood damage (in mil. €)	Costs (in mil. €)		Total costs and damage (in mil. €)
				Rescue operations	Protection operations	
2004	350	13,717.0	34.91	1.23	3.42	39.56
2005	237	9,236.8	24.03	2.24	2.67	28.94
2006	512	30,729.7	47.90	5.98	6.42	60.30
2007	60	339.5	2.49	0.30	0.21	3.00
2008	188	3,570.0	39.75	3.59	2.51	45.85
2009	165	6,867.2	8.41	1.59	1.30	11.30

Source: Reports on floods in Slovakia 2004 – 2009 (Ministry of Agriculture of the Slovak Republic and the Ministry of Environment of the Slovak Republic)

The total flood damage and costs for rescue operations and protection measures in 2004 – 2009 are shown in the figure 9.1.1.



9.1.1 Flood Protection Programmes

Flood Protection Programme in the Slovak Republic by 2010

Updated need of financial means for the implementation of the whole „Flood Protection Programme in the Slovak Republic by 2010“ is about 689.305 mil. € out of which the amount 611.267 mil. € is allocated to the Slovak Water Management Enterprise, Žilina.

As of December 31, 2009 the SWME implemented flood protection measures of investment construction in the amount 176.272 mil. € within planned activities according to the „Programme“. Total deficit of the SWME represents 434.994 mil. € in relation to flood protection on rivers, water structures and river basins.

Operation Programme Environment for the Years 2007 - 2013

The Operation Programme Environment (OPE) represents a programme document of the Slovak Republic for provision of financial assistance from the EU funds for environment for the years of 2007 – 2013.

Total investment into constructions approved within the first call to submit the request for non-refundable financial means from the „Operation Programme“ was in the amount of 9,060,048 €. As of December 31, 2009 the financing related to these constructions was as follows:

Own resources	192,105 €
Co-financing from State Budget	370,896 €
EU sources	2,101,744 €
Total	2,664,745 €

Floods Warning and Forecast System (POVAPSYS)

In 2009 the following outcomes were obtained:

- Monthly assessment reports on measured data quality with proposed solutions for specified deficiencies.
- Radiolocation and numerical products for POVAPSYS operation.
- Calibrated and tested models and forecast systems for selected forecasting profiles.
- Proposal and specification of operational database for the POVAPSYS project.
- Analysis of control systems for hydrological forecasting used worldwide from the viewpoint of prevalence, availability and references suitable for Slovak conditions.

9.1.2 Action Programme of Sustainable Flood Protection in the Danube River Basin

In 2009 the building the constructions of 2008 continued within the activities related to the Action Programme of Sustainable Flood Protection in the Danube Basin.

Flood action plans in 17 sub-basins of the Danube were published, prepared and approved by 13 Member States of the ICPDR. The whole process was coordinated by the ICPDR. These planes offer a complex overview of the activities focused on decreasing the flood risk in the international Danube River Basin. The lists of measures were prepared at national level and harmonized with neighbouring states. Slovak experts participated in preparation of flood action plans in the following sub-basins:

- Morava (together with the Czech Republic and Austria),
- Váh, Hron and Ipeľ (together with the Czech Republic and Hungary),
- Pannonian Central Danube (together with Austria, Hungary and Croatia),
- Tisa (together with Ukraine, Romania, Hungary and Serbia).

In 2009 the project Danube Floodrisk started and it was focused on mapping the flood risk and vulnerability in the Danube Basin.

9.1.3 Directive of the European Parliament and of the Council 2007/60/EC on the Assessment and Management of Flood Risks

Ministry of Environment of the Slovak Republic modified the programme manual of the Operation Programme Environment 2.1.4 Groups of Eligible Activities at the level of the operational objective 2.1 II. group: Measures resulting from the Directive of the European Parliament and of the Council on the Assessment and Management of Flood Risks including the Flood Risk Management Plans:

- A. Preparation of supporting studies, preparation of methodologies how to make, re-evaluate and update:
 1. preliminary assessment of flood risk,
 2. flood hazard and flood risk maps,
 3. flood risk management plans.
- B. Preparation of flood hazard and flood risk maps.
- C. Preparation of Flood Risk Management Plans or their activities.

9.2 Quality Control in Water Protection and Solutions to Emergency Water Quality Deterioration

346 (25.6 %) cases of law violation was reported from the total number of 1,351 checks in 2009.

An overview of number of checks carried out in the years 2005 - 2009, when a violation of the law was reported, is indicated in the table 9.2.1.

table 9.2.1

Water Protection Inspection	Act 364/2004 Coll.		Act 261/2002 Coll.		Act 163/2001 Coll.		Total	
	Number of checks	Law violation	Number of checks	Law violation	Number of checks	Law violation	Number of checks	Law violation
2005	1,467	332	43	4	4	0	1,514	336
2006	1,713	436	43	4	32	3	1,788	443
2007	1,567	356	59	5	11	0	1,637	361
2008	1,291	375	40	4	10	0	1,341	379
2009	1,298	342	40	4	13	0	1,351	346

Emergency Water Quality Deterioration

In 2009 as many as 101 cases of emergency water quality deterioration were reported by the Slovak Environmental Inspection (SEI). Out of 167 potential cases the Water Protection Inspection excluded 66 cases according to the § 41, Article 1 of Water Act and therefore they are not in the records anymore. Out of 101 reported cases the cause was found out in 79 cases. Surface water quality was deteriorated in 50 cases and ground water was polluted in 51 cases (table 9.2.2.).

Overview of reported cases in the years 2005 - 2009

table 9.2.2

Year	Emergency water quality deterioration						
	Number of reported cases	Surface water			Ground water		
		Total number	Rivers and reservoirs	Boundary rivers	Total number	Pollution	At risk
2005	119	66	2	5	53	2	51
2006	151	94	1	3	57	6	51
2007	157	97	1	4	0	4	56
2008	102	49	0	6	53	4	49
2009	101	50	1	3	51	7	44

In 2009 the most frequent cause of emergency water quality deterioration was road and railway transport (30.6%).

Emergency water quality deterioration was mostly caused by oil substances in 65 cases (64.3 %), waste waters in 17 cases (16.8 %) and a pollutant was not identified in 13 cases (12.8 %).

In 2009 as many as 13 cases were connected to fish kill, 2 of them were caused by waste waters and one by agricultural fertilizers. In 10 cases a kind of harmful or extremely harmful substance was not found out.

The assistance of the Basic International Warning Centre Slovakia (PIAC 04) within the System of Early Warning in the Danube River was activated twice.

10 ECONOMIC ANALYSIS

Slovak Water Management Enterprise, state enterprise, Žilina

The Slovak Water Management Enterprise, state enterprise, reached the profit of 99,498 thous. € in 2009, which represents decrease by 20.4 % compared to the year 2008.

Compared to the year 2008 the total costs decreased by 14,591 thous. € and reached the amount of 108,528 thous. €.

Production of Surface Water

In 2009 the amount of 261,923 thous. m³ of surface water was abstracted in physical units for 21,822 thous. € what represents exceeding the plan by 7,330 thous. m³, in financial terms by 734 thous. €.

In 2009 the payments for using the hydro-energetic potential of water courses at water constructions were higher by 2,729 thous. €. comparing to the plan of the same period. Surface water abstraction was in the financial amount of 12,054 thous. € which corresponds with 304,051 thous. m³.

Water Management Construction, state enterprise, Bratislava

In 2009 the company reached good economic results in the amount of 37,034 thous. € which is an increase by almost 39 % comparing to the preceding period.

In 2009 the company profit amounted to 131,384 thous. €. The most important activity of the company related to the profit is production of electricity in hydro-electric power plants of Gabčíkovo Waterworks.

Total costs amounted to 94,350 thous. € which is a decrease by 24.13 % compared to the last year.

Hydroconsult, state enterprise, Bratislava

Decision of the Minister of Environment of the Slovak Republic no. 47/2009 -1.10 of October 26, 2009 terminated the existence of Hydroconsult, state enterprise, Bratislava. Since November 1, 2009 it exists as a department of the Section 5000 – Section of Technological Development and Investments at the Water Management Construction, state enterprise, Bratislava.

Water Companies

Infrastructural property of public water supply systems and public sewage systems was operated by water companies and other entities, which provided information to elaborator of the Report on Water Management of the Slovak Republic in 2009. All entities were included into the overview of indicators.

The profits from sales of their own products and services in respective water companies decreased by 8,438 thous. € (to 411,120 thous. €) compared to 2008. Economic result after taxation represented a decrease to -6,922 thous. € in comparison to 2008.

The costs of water companies compared to 2008 amounted to 425 856 thous. € which is an increase by 10,127 thous. €. In 2009 tangible and non-tangible investments were in the amount of 303,399 thous. € out of which own resources were 140,602 thous. €.

Water companies in 2009 produced 304,605.5 thous. m³ of water in their own facilities. Invoiced drinking water represented 206,694 thous. m³ out of this volume.

An overview on achieved economic results for individual groups of state enterprises, water companies and other entities providing drinking water supply and waste water collection is shown in the table 10.2.

[in thous. €]

table 10.2

Indicator	Year	WC+other entities	SWME	WMC+HYCO	WM total
Revenues	2008	419,558	125,033	151,428	696,019
	2009	411,120	99,498	131,384	642,002
	Index 2009/2008	0.98	0.80	0.87	0.92
Expenditures	2008	415,729	123,119	124,902	663,750
	2009	425,856	108,528	94,350	628,734
	Index 2009/2008	1.02	0.88	0.76	0.95
Net income after taxation	2008	7,288	1,915	26,839	36,042
	2009	- 6,922	- 9,030	37,034	21,082
	Index 2009/2008	-0.95	- 4.72	1.38	0.58

10.1 Effect of Economic Tools

Drinking and Waste Water Prices

In 2009 the Office for Regulation of Network Industries of the Slovak Republic managed the price regulation according to the Act no. 276/2001 Coll. on Regulation in Network Industries and Amendment of Some Acts and in line with the regulation policy approved by the Regulatory Committee for the period 2009 - 2011.

In 2009 the prices for drinking water production, distribution and supply by public water supply system increased on average by 3.8 % compared to 2008. These prices without VAT were in the range from 0.6566 €/m³ (19.78 SKK/m³) in Trnava Water Company to 1.1485 €/m³ (34.60 SKK/m³) in East Slovakia Water Company in 2009.

In 2009 the prices for collection and treatment of waste water by public sewerage system increased by 6.1 % compared to 2008 mainly because of applying the investment factor in the calculation of the price for waste water collection and treatment. This was done to support a development of public sewerage systems and waste water treatment plants and to support fulfilling the obligations of the Slovak Republic to the European Union.

In 2009 the prices for waste water collection and treatment by public sewerage system were in the range from 0.7103 €/m³ (20.00 SKK/m³) in East Slovakia Water Company to 0.8889 €/m³ (26.78 SKK/m³) in Orava Water Company.

In 2009 the prices for production and supply of drinking water by public water supply system and prices for treatment and collection of waste water by public sewerage system together increased on average by 4.8 % compared to 2008. Maximal water charges for municipal sewerage network was in the range from 1.4768 €/m³ (44.49 SKK/m³) to 1.8589 €/m³ (56.00 SKK/m³) without VAT.

Payments of households for water do not increase proportionally with prices because water consumption in households continually decreases approximately by 2 % during the year. The lowest water tariffs for households are in the region of Komárno while the highest are for households in the East Slovakia Region.

Drinking water

table 10.1.1

	Unit of measure	2005	2006	2007	2008	2009
Eligible costs	thous. €	161,854	179,015	182,168	186,261	183,118
Drinking water supply	thous.m ³	223,064	216,569	216,516	220,861	206,694
Average eligible costs	€.m ⁻³	0.73	0.83	0.84	0.84	0.89
Average price (without VAT)	€.m ⁻³	0.76	0.84	0.81	0.83	0.89
Price for households (without VAT)	€.m ⁻³	0.73	0.84	0.83	0.82	0.90
Average price for others (without VAT)	€.m ⁻³	0.82	0.83	0.77	0.84	0.88

Waste water

table 10.1.2

	Unit of measure	2005	2006	2007	2008	2009
Eligible costs	thous. €	117,374	179,048	136,161	140,754	160,780
Volume of waste water	thous.m ³	240,619	205,751	208,991	207,006	201,384
Average eligible costs	€.m ⁻³	0.49	0.62	0.65	0.68	0.80
Average price (without VAT)	€.m ⁻³	0.57	0.71	0.68	0.73	0.79
Price for households (without VAT)	€.m ⁻³	0.52	0.69	0.68	0.72	0.77
Average price for others (without VAT)	€.m ⁻³	0.61	0.74	0.69	0.73	0.76

figure 10.1.1

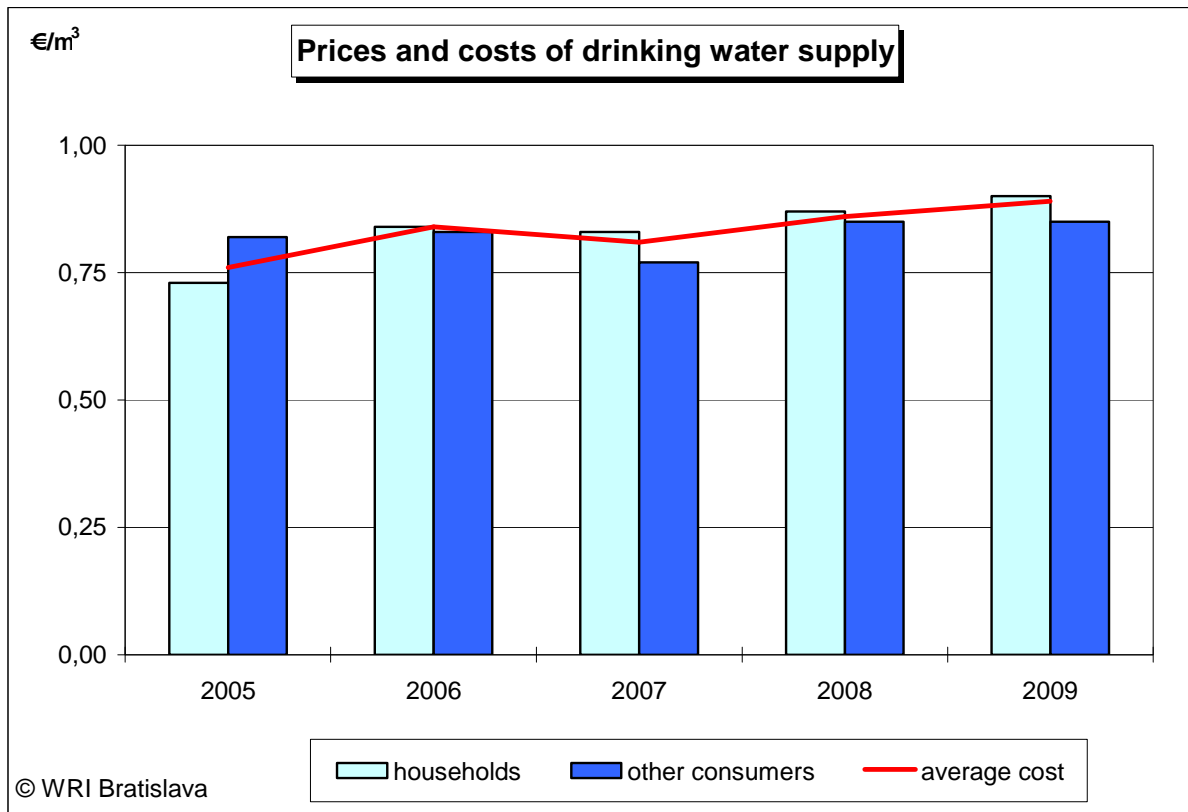
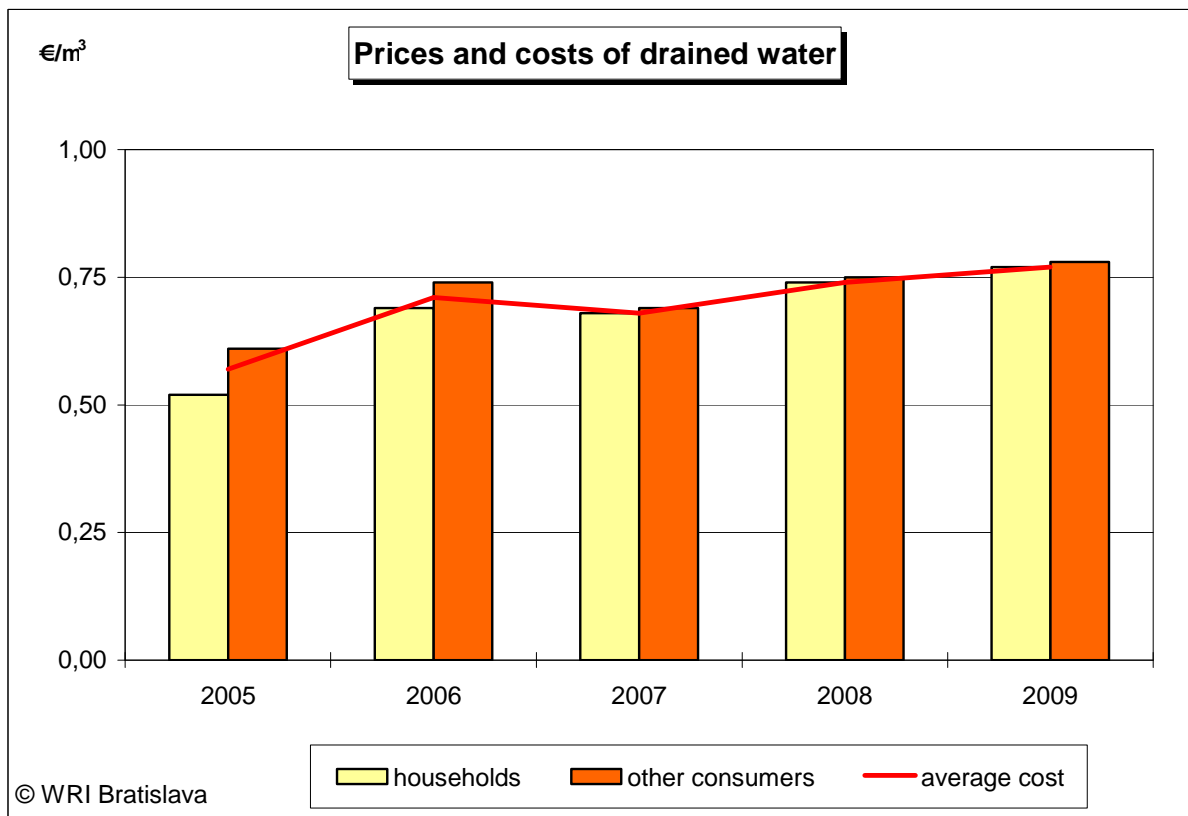


figure 10.1.2



Payments for Water Management Services Related to the Use of Watercourses

Development of Surface Water Price Levels According to Revenues (VAT excluded)

The Office for Regulation of Network Industries of the Slovak Republic (ORNI) has been determining the payments for surface water usage since 2005 according to the Water Act specifying the payments subject to price regulation of the Office and in line with the Government Regulation SR 755/2004 Coll. setting the amount of non-regulated payments, height of fees and other details related to payment for water utilization as amended by the Government Regulation no. 367/2008 Coll. amending the Government Regulation no. 755/2004 Coll.

The SWME in Žilina is dominant regulatory entity with monopoly position executing regulatory activities in this area.

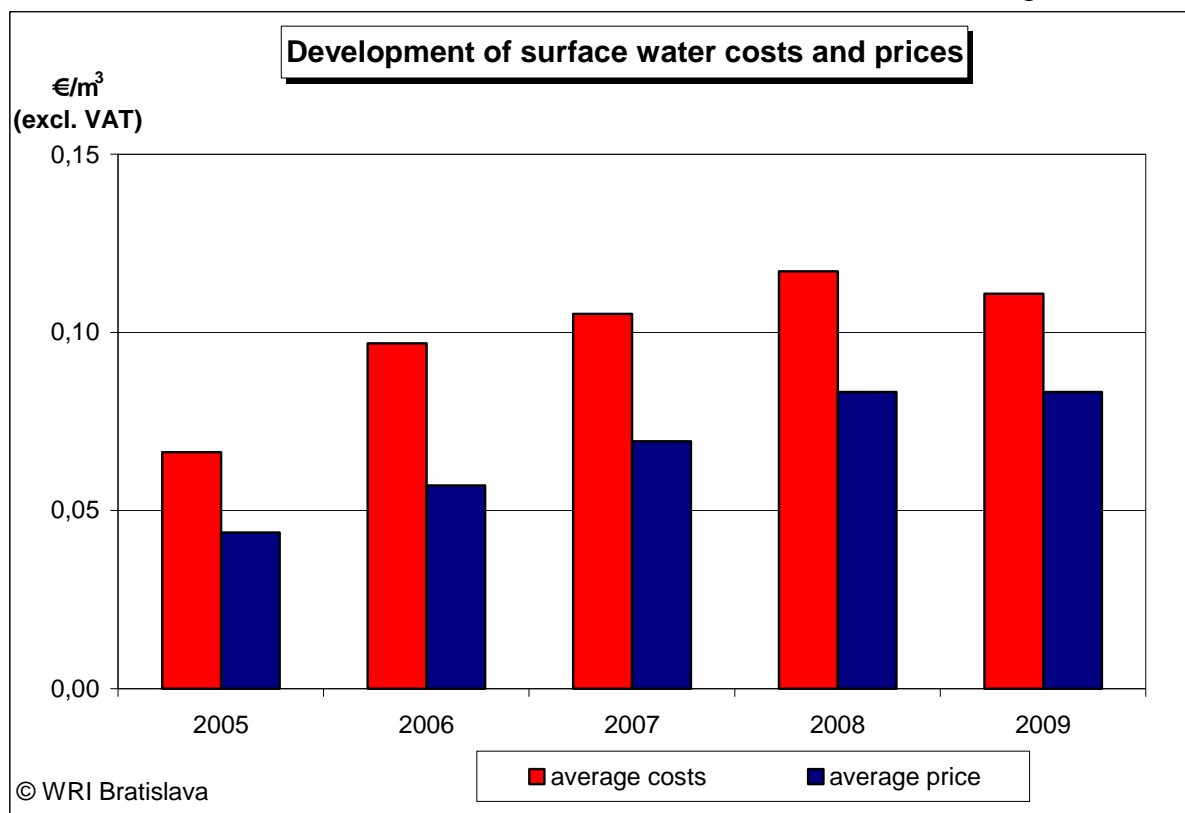
By decision the ORNI defined maximum prices for surface water abstraction from rivers in the amount of 0.083317 €/m³ (2.51 SKK/m³) for related regulatory entity in 2009 and therefore this price remained the same as it was in 2008.

Development of surface water prices out of revenues (without VAT)
in the years 2007 – 2009 for the SWME, Žilina

table 10.1.3

	Unit of measure	2005	2006	2007	2008	2009
Average costs	€/m ³	0.0664	0.0969	0.1052	0.1172	0.1109
Average price	€/m ³	0.0438	0.0571	0.0694	0.0833	0.0833

figure 10.1.3



Taxes

In 2009 a decrease was recorded in real estate tax, road tax and value added tax compared to previous year.

The range of tax burden by individual taxes can be seen in the following table 10.1.4.

[in thous. €]

table 10.1.4

Taxes	2005	2006	2007	2008	2009	Index 2009/2008
Value Added Tax	38,803	30,988	20,774	19,792	19,483	0.98
Real Estate Tax	1,591	1,383	1,369	1,474	1,288	0.87
of which : land tax	827	804	767	855	720	0.84
construction tax	460	556	602	599	568	0.95
Road Tax	915	946	1,018	959	686	0.72
Legal Entity Income Tax	3,961	3,954	21,801	21,237	16,621	0.78

Loans

Compared to 2008 bank loans and aids increased by the amount of 23,577 thous. €. Long-term bank loans amounted to 112,077 thous. € and compared to 2008 they increased by 16,556 thous. €. Current bank loans amounted to 29,683 thous. €. Compared to 2008 they increased by 5,655 thous. €.

[in thous. €]

table 10.1.5

Loans	2005	2006	2007	2008	2009	Index 2009/2008
Banks loans and aids	306,604	110,748	104,957	119,548	143,125	1.20
of which: long-term bank loans	286,630	78,145	69,030	95,521	112,077	1.17
current bank loans	19,974	32,603	40,190	24,028	29,683	1.24

10.2 Labour Force, Salaries

The overview of number of employees and emolument indicators in water management (WM) state enterprises and water companies is indicated in the table 10.2.1.

table 10.2.1

Indicator	2005	2006	2007	2008	2009	Diffe- rence 2009/08	Index 2009/ 2008
Water companies employees total	8,833	8,736	8,638	8,233	8,163	- 70	0.99
SWME employees total	4,129	4,097	3,922	3,708	3,663	- 45	0.99
Other state enterprises employees (WMC+HYCO)	285	281	264	213	194	- 19	0.91
WM employees total	13,247	13,114	12,824	12,154	12,020	- 134	0.99
Average salary in WM total (€)	611	674	721	778	797	19	0.25
Average salary in WC total (€)	593	649	689	723	754	31	1.04
Labour productivity of revenues in WM (thous. €/head)	45	51	49	55	53	- 2	0.96

10.3 Financing of Investment Constructions in Water Management

In 2009 no capital financial means were allocated to the SWME, Žilina for investment activities.

The total volume of investment construction represented 27.991 mil. €.

The own financial resources in the amount of 12.378 mil. € were used for financing investment constructions.

The investment activities financed by the resources from the EU funds were in the total amount of 13.859 mil. € and the amount of 1.754 mil. € was provided by the state budget to co-finance the projects.

Amounts for individual branches are as follows:

Branch Bratislava	17.081 mil. €
Branch Piešťany	6.255 mil. €
Branch Banská Bystrica	2.223 mil. €
Branch Košice	0.943 mil. €
<u>Company management</u>	<u>1.489 mil. €</u>
Total SWME	27.991 mil. €

In 2009 the **Water Management Construction** carried out investments using the total amount of 9.443 mil. € involving its own resources and financial grants from the EU and the Ministry of Environment of the Slovak Republic which were used for the LIFE Project implementation.

In 2009 the money was invested mainly in Gabčíkovo and Žilina Waterworks in the following amounts:

SVD G – N	7.363 mil. €
VD Žilina	0.642 mil. €

In 2009 the **Water Companies** used their own resources for investments in the amount of 139.253 mil. €:

BVS, a. s.	27.581 mil. €	TURVOD, a. s.	1.572 mil. €
TAVOS, a. s.	5.235 mil. €	PovVS, a. s.	2.102 mil. €
ZsVS, a. s.	22.662 mil. €	VSR, a. s.	1.429 mil. €
TVa K, a. s.	2.284 mil. €	StVS, a. s.	23.191 mil. €
SEVAK, a. s.	3.410 mil. €	VVS, a. s.	39.194 mil. €
OVS, a. s.	1.880 mil. €	PVS, a. s.	7.655 mil. €
LVS, a. s.	1.058 mil. €		

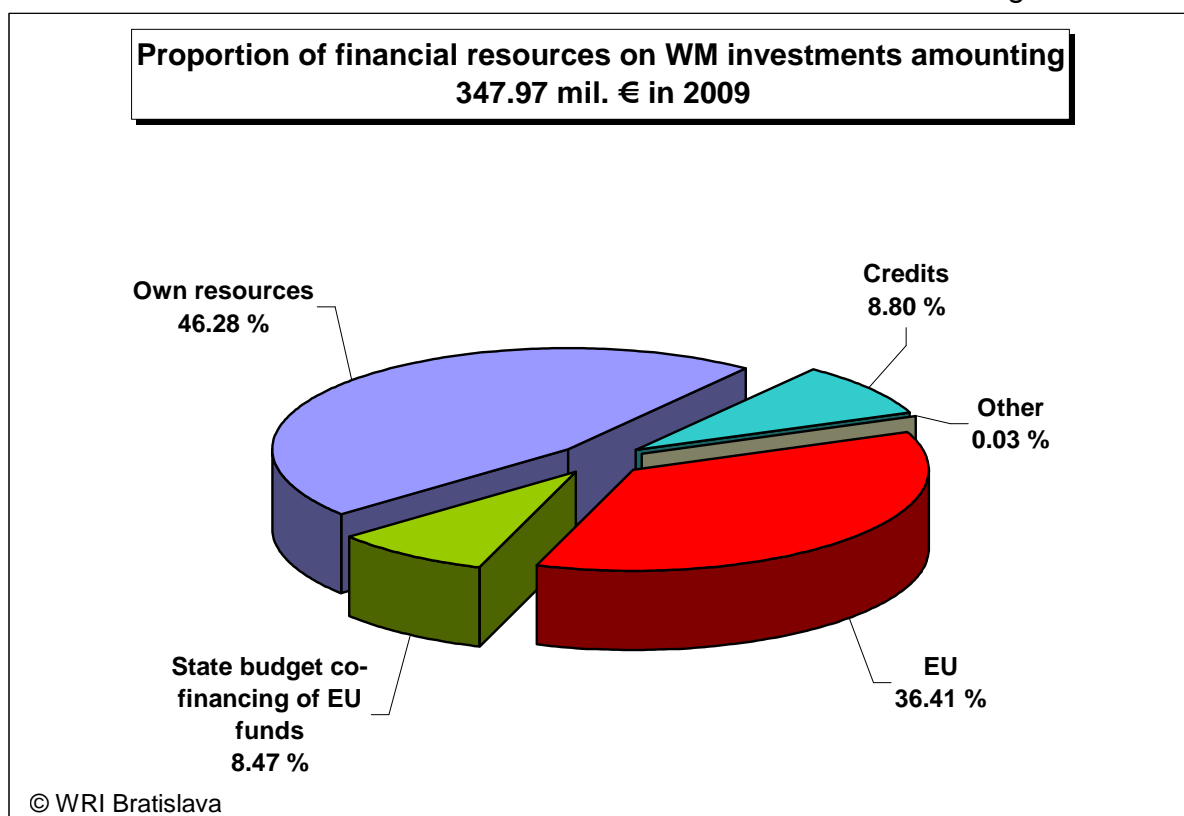
Constructions of water supply and sewage system were financed from the EU funds in the amount of 112.811 mil. €. Investment activities in the amount of 27.715 mil. € were co-financed by the state budget.

An overview of investment construction financial resources in the years 2008 and 2009 is indicated in the table 10.3.1 and figure 10.3.1.

table 10. 3. 1

Financial resources	SWME		WC and other entities		WMC		Total WM	
	2008	2009	2008	2009	2008	2009	2008	2009
State Budget (SB)	10.35	-	-	-	-	-	10.35	-
Own resources	8.80	12.38	123.49	139.25	15.34	9.41	147.63	161.04
EU funds	12.45	13.86	131.08	112.81	-	0.02	143.53	126.69
Co-financing of SB to EU funds	1.59	1.75	34.59	27.72	-	0.02	36.18	29.49
Loans	-	-	32.80	30.63	-	-	32.80	30.63
Others	0.03	-	0.54	0.12	-	-	0.57	0.12
TOTAL	33.22	27.99	322.50	310.53	15.34	9.45	371.06	347.97

figure 10.3.1



11 OVERVIEW OF RIVER BASIN MANAGEMENT PROGRAMMES AND PLANS

River Basin Management Plans

According to § 12 of Water Act the following is being elaborated:

- Sub-basin management plans for the administrative area of the Danube River Basin and the administrative area of the Vistula River Basin
- and the Water Plan of the Slovak Republic.

Deadline for preparation and approval of above-mentioned plans for the first planning cycle was December 22, 2009. This deadline was important for preparation of 9 sub-basin management plans which were approved by the Ministry of Environment of the Slovak Republic. Related areas are: administrative area of the Danube River Basin for the sub-basin of the Danube, Morava, Váh, Hron, Ipel', Slaná, Bodrog, Hornád and Bodva. Furthermore, the deadline was valid for the management plan of the Dunajec and Poprad sub-basin within the administrative area of the Vistula River Basin.

Water Plan of the Slovak Republic was prepared as the comprehensive document of water management planning and it contains sub-basin management plans for the administrative area of the Danube River Basin and the administrative area for the Vistula River Basin. Water Plan includes a programme of measures containing the measures necessary for fulfilling the commitments of the Slovak Republic specified within transitional periods and routed in the EU Common Position and measures resulting from the WFD necessary for achieving good water condition.

According to § 15 of the Water Act the measures included in the Programme of Measures must be implemented till December 22, 2012 unless the exceptions according to § 16 of Water Act were applied.

Besides national river basin management plans, the Slovak Republic participated in the preparation of the Management Plan for the International Administrative Area of the Danube River Basin which was approved by the ICPDR on 10 December 2009 and in the preparation of the Management Plan for the International Administrative Area of the Vistula Sub-Basin which will be finished and approved in 2010.

All river basin management plans are available to the public at the website www.vuvh.sk/rsv2.

Flood Risk Management Plans

Duty to prepare the flood risk management plans results from § 8 of the Act no. 7/2010 Coll. on Flood Protection. These plans are prepared according to related sub-basins of the administrative area of the Danube River Basin and the administrative area of the Vistula River Basin. The first stage of preparation of the flood risk management plans is preliminary flood risk assessment with the purpose of identifying the territories with potential flood risk or where flood occurrence is highly probable. Deadline for finishing these works is December 22, 2011.

Continually with above-mentioned works there is elaboration of flood hazard and flood risk maps. On the maps there will be geographic areas which may be flooded with different potential flood occurrence; extreme areas; possible flood extent and potential negative impact. Deadline for preparation of these maps is December 22, 2013.

First flood risk management plans containing specified flood protection objectives and mitigation measures reducing flood consequences must be elaborated till December 22, 2015. After the Ministry of Environment of the Slovak Republic approves these plans, they will become a part of the management plan for related administrative area of the basin.

The states who signed the Danube River Protection Convention and are the Members of the ICPDR agreed that 17 coordinated flood risk management plans will be elaborated for the Danube River Basin at the international level.

12 RESEARCH, EDUCATION, ENVIRONMENTAL TRAINING, PUBLICITY AND PROMOTION

12.1 Research

Scientific – technical projects of international, national and local importance were solved within the scientific research activity at the **WRI Bratislava** in 2009.

Important institute activities in 2009 were also research works related to water management practice. The works were focused on preparation of flood hazard and flood risk maps, physical modelling of flood protection plans for urban areas of villages and towns and calibration of current meters and flow meters. Significant contribution of the institute is also managing a proper laboratory practice in institutions participating in examining the state of environment through organizing the interlaboratory comparison tests. The institute also provided the environmental assessment of strategic documents of larger regional units.

In 2009 the Water Research Institute, which is responsible for WFD implementation and technical coordination of tasks accomplished by co-operating institutions, performed all works according to approved strategies for the WFD implementation.

It actively participated in finalizing the final version of bills within their legislative approval process as well as in processing and preparation of procedural regulations to these bills.

It provided professional – technical help in preparation of Slovak technical standards in water management.

It participated in fulfilling the obligations of the Slovak Republic resulting from international conventions and bilateral agreements of the Slovak Republic on transboundary waters with neighbouring states.

In 2009 the National Water Reference Laboratory received 7,675 samples for analyses and carried out totally 164,543 analyses out of which the amount of 126 829 was accredited and the amount of 37,714 was not accredited.

In the Calibration Laboratory of Water Meters, which is the authorised metrological workplace, the amount of 20 water meters of overflowed amount of cold water, 1 flow meter for hot water and 12 heat meters were verified and 20 flow meters were calibrated in 2009.

In the Calibration Laboratory of Water Meters the amount of 97 current meters were calibrated in 2009.

In 2009 the **SWME, state enterprise, Žilina** dealt with the following tasks:

- in the sphere of the WFD implementation it participated in the preparation of the River Basin Management Plan and the Water Plan of the Slovak Republic
- It participated in works related to the transposition of the Directive of the European Parliament and the Council 2007/60/ES of October 23, 2007 on flood risk management and assessment into national legislation. It also worked on a pilot project „*Assessment and Management of Anti-flood Risk in Myjava River Basin*“.
- It performed the tasks resulting from the implementation of other related EU legislation; national, European and international standardization.

- it dealt with water management development tasks and studies
- In international cooperation the company was focused on the activities resulting from the measures of individual transboundary water committees and government delegates for issues related to cooperation on transboundary rivers.
- Cooperation within international projects was also significant - *NEWADA, DANUBE FLOOD RISK, „Establishment of the Information System PLUSK for mutual Poland-Slovakia transboundary waters“, Survey of border area and Ipeľ River Basin”, CEFRAME, UNDP/GEF, „Space for water in the Bodrog River Basin“, WACO, “Enhancement of Flood Management and and Anti-flood Planning in the Hornád River Basin in the Territory of the Slovak Republic”, “Integrated protection system of crucial infrastructure activity (IMPACT)”*.

In the research field the **SHMI, Bratislava** dealt with 8 tasks out of which 6 were institute projects, 1 was within the 7th Framework Programme and 1 was within the Slovak Research and Development Agency.

Out of 6 major researched topics, 4 of them were more or less related to water:

- development, adaptation and maintenance of forecasting numerical weather models and development of warning service and nowcasting
- tasks of the National Climate Programme
- hydro-geological drought
- coding the data from radio locators

Extra budgetary resources (structural funds including) covered 10 more projects at the SHMI. Out of this number 6 projects were partially related to water: hydro-prognosis, operative and regime hydrology, water quality and water management - *H-SAF, „Implementation of biological safety in conditions of the Slovak Republic“, System and technical equipment of SHMI laboratories in relation with air quality monitoring“, Building and reconstruction of monitoring structures of ground water“, Consequences of climate change and possible adaptation measures in individual sectors in Slovakia“, „Integration of principles and practices of ecological management into landscape and water management in the East Slovakia Lowland“*.

12.2 Education, Environmental Training

In 2009 within methodical and training activities the **Water Research Institute** experts prepared the following trainings for employees of the Slovak Water Management Enterprise, water companies and other entities:

- Training Course on Microbiology – basics of microbiology in laboratory
- Training Course on Ground and Waste Water Sampling
- Training Course on Hydro-metering,
- Radiochemistry Workshop,
- Course for Water Managers – 1st level
- Training Course on Microbiology
- Course for Water Managers – 2nd level
- Microbiology of water and environment
- Training Course on Surface and Drinking Water Sampling

WRI as the main organizer prepared 3 expert conferences:

- Sediments of Rivers and Water Reservoirs – conference with international participation

- International Geothermal Days Slovakia 2009 with the subtitle National Development of Geothermal Energy Use
- Reconstructions of Sewerage Networks and Waste Water Treatment Plants – biennial conference with international participation

Also in 2009 the WRI was one of the partners of the project „Young Slovak Scientists“ of the Slovak Research and Development Agency.

In 2009 the education and environmental training were performed by the **SWME, Žilina** through the following activities:

- Involvement of expert employees in the activities related to organising the World Water Day and the Open Day,
- Quizzes and presentation for young people and teen-agers,
- Presentations of employees in electronic media (in radio broadcasting and TV),
- Presentations of employees in press media,
- Organising press conferences for media,
- Publication activity for employees,
- Opponent's statements (university theses, dissertation theses, scientific and technical tasks, etc.).

SHMI Bratislava supports development of human resources in all educational categories.

It is a member of the Association of Employers in Water Management, it is represented in the Slovak Committee for Hydrology, the Department for Water Management in the Slovak Academy of Agricultural Sciences, in the Slovak Meteorological Society, in the Slovak Bio-climatological Society and in GWP Slovakia. It closely co-operates with the Slovak Water Management Society and the Association of Hydrologists in Slovakia.

It has its own Scientific Council, which acts as an advisory body to the management, it creates the space for organising expert events: seminars, conferences, methodological consultations, competitions - conferences for young hydrologists, water managers, workshops on the occasion of the World Water Day, workshops related to project implementation. It organizes events within the Week of Science in Slovakia.

The results of the research and operational activity were presented by institute employees in different publications.

The Slovak Hydro-meteorological Institute establishes active contacts with universities (mainly Faculty of Mathematics, Physics and Informatics of Comenius University in Bratislava; Faculty of Natural Sciences of Comenius University in Bratislava; Faculty of Civil Engineering of the Slovak University of Technology; Slovak University of Agriculture in Nitra; Technical University in Zvolen), institutes of the Slovak Academy of Science and departmental research institutes with the same or similar specialization.

The library of the SHMI serves to its employees as a basic information source in their professional activities and gaining expert knowledge.

One of main organizational components of the **Slovak Environmental Agency(SEA), Banská Bystrica** providing environmental education is the Centre of Environmental Education (CEVV). In 2009 it provided practical environmental education and it mainly offered full service for seminars, workshops and meetings

organized by departmental organizations of the Ministry of Environment of the Slovak Republic. In 2009 the Slovak Environmental Agency operated the following Environmental Education Centres - Teplý Vrch, Modra Harmónia, Spišská Sobota, Regetovka, Dropie.

In 2009 the following activities related to environmental education were carried out at the SEA: *ENVIROFILM*, *services of SEA environmental library*, *HYPERICUM*, *summer camps for children not older than 15 years*, *ŠIŠKA*, *Alive Nature - BISEL*, *ProEnviro*, *EnviroOtázniky*, *Green School*.

12.3 Promotion

In 2009 **the WRI Bratislava** published 23 papers in scientific journals 28 papers in technical journals and 102 papers in conference proceedings.

Comprehensive publication activity can be found at:
http://www.vuvh.sk/index.php/sk_SK/kniznica/kniznica-publikacna-cinnost

The part of edition and publication activity are the following publications: Lists Slovak Technical Standards in water management, Report on Water management in the Slovak Republic (http://www.vuvh.sk/index.php/sk_SK/dok).

The *Water Management Journal* has been prepared and edited in the WRI and published by the Association of Employers in Water Management in Slovakia.

- SWME, Žilina:** within its editorial and promotion activities
- publishes its own expert, promotion and information materials,
 - cooperates with expert periodicals - e.g. *Water Management Journal*, *Enviro-magazine*, *Water Management Magazine* etc.,
 - actively supports presentation activities of its employees at conferences and workshops.

- SHMI, Bratislava** publishes its own:
- expert periodicals: year books, reports, bulletins and assessments,
 - information materials: overview of publication activities of employees of the Slovak Hydro-meteorological Institute,
 - promotion and information materials and proceedings from the conferences organized within the institute.

It cooperates with other expert periodicals (*Water Management Magazine*, *Water Management Journal*, *Meteorological Reports*, *Enviro-magazine*, *Acta Hydrologica Slovaca*, and *Environment*). It is represented in editorial boards of national and international journals.

It supports promotion of its activity, mainly through co-operation with elementary, secondary schools and with universities. It maintains contacts with the public and media and organizes the traditional Free Entrance Day.

SEA, Banská Bystrica published 6 issues a 2 special issues of *Enviro-magazine*, Report on State of Environment of the Slovak Republic, topic documents concerning educational activities in 2009.

13 CONCLUSION

Currently, the water management sector of Slovakia is regulated under the Concept of Water Policy by 2015, the National Programme of Slovakia for the implementation of the Directive 91/271/EEC and the Development plan for public water supply and sewerage systems for the territory of Slovakia. Those materials already take into account the requirements of the WFD and other EU directives in the field of water, which are fully transposed into the legislation of the Slovak Republic.

The membership of Slovakia in the EU related to *acquis communautaire* brought the most significant changes in processing water planning documents, i.e. harmonization of national legislation with EU legislation and its implementation in practice. The WFD is one of the most important directives in the field of environment and it brings the most comprehensive set of objectives, instruments and responsibilities in the field of water policy, creating the basis for a common water policy in the EU countries.

The year 2009 was the first important milestone for the WFD implementation process (2003 - 2027), when the published and approved River Basin Management Plans for Slovakia had to be agreed by the public.

The key phase of the WFD implementation will include the programmes of measures for achieving environmental objectives in 2009 - 2012 and evaluation of their efficiency in order to achieve good status of waters by 2015.

The Water Research Institute under the auspices of the Ministry of Environment developed websites containing information on issues related to the implementation of the WFD in Slovakia. These websites were updated within the project funded from the Operational Programme - Environment 2007 - 2013 "Information and educational campaign on water planning in accordance with the Directive 2000/60/ES in relation to nature and landscape protection".

The total population supplied with drinking water from public water supply systems increased only by 11.2 thousand compared to the previous year (4,681.6 thousand inhabitants supplied with drinking water in 2009). Percentage of inhabitants supplied with drinking water from public water supply remained at the same level as in 2008 (86.3 % of the total population of Slovakia).

Development of public sewerage system is lacking behind the development of public water supply system in the Slovak Republic. In 2009 there was an increase of number of inhabitants living in houses connected to public sewerage system by 28.4 thousand inhabitants to 3,225.0 thousand inhabitants which is 59.5 % of the total number of inhabitants.

Crucial document for waste water treatment is the Council Directive 91/271/EHS related to collection, treatment and discharge of urban waste water. Its implementation is very expensive in terms of construction and reconstruction of sewerage systems as well as suitable waste water treatment in WWTPs. According to estimated costs for implementation of the requirements of the above mentioned directive, the deficit was in the amount of 1,235.8 mil. € for 2008, it will have been in the amount of 1,281.1 mil. € by 2010 and in the amount of 1,757.3 mil. € by 2015. Demands highly exceed the amount of 691 mil. € allocated from EU funds for sewerage system construction in second planning period of the years 2007 – 2013.

Flood protection activities were focused on implementation of preventive measures according to the Flood Protection Programme and building the Flood Warning and Forecast System (POVAPSYS) as well as the measures resulting from the Directive of the European Parliament and the Council 2007/60/ES including flood risk management plans.

Financial problems related to flood protection are still vital. At the end of 2009 there was a shift between the Flood Protection Programme in Slovakia till 2010 and the planned time schedule as much as 0.4112 mld. €.

Within the Operational Programme - Environment 2007 – 2013 there was the financial amount of 120 mil. € allocated for flood protection. Besides considering the EU financial resources, some money from the State Budget and own sources of river authorities will be taken into account.

LIST OF ABBREVIATIONS

AEWIS	Autonomous Early Warning and Information System
BE	Branch Enterprise
DE RA	Department of Environment of Regional Authority
DE DA	Department of Environment of District Authority
EEC	Economic justified costs
ES	European Standards
EU	European Union
GDP	Gross Domestic Product
HEP	Hydro-ecological Plan
HYCO	Hydro-consult, s.e., Bratislava
LA	Local Authorities
MA SR	Ministry of Agriculture of the SR
ME SR	Ministry of Environment of the SR
MUSES	Local landscape system of ecological stability
ORNI	Office for Regulation in Network Industries
OTN	Sectoral Technical Standards
Q_a	Long term Average rate of flow
Q_{min}	Minimal monitored rate of flow
Q_{100}	Water volume reached or exceeded once in 100 years
Q_{365d}	Flow exceeded approximately during 365 days in a year
RIS	River Information Services
RUSES	Regional landscape system of ecological stability
SB	State Budget
SHMI	Slovak Hydrometeorological Institute
SEI	Slovak Environmental Inspection
STN	Slovak Technical Standard
SWME	State Water Management Enterprise, s.e. Banská Štiavnica
TC	Technical Committees
VAT	Value Added Tax
WFD	Water Framework Directive
WMC	Water Management Company
WMP	Water Management Plan
WRI	Water Research Institute Bratislava
WC	Water Company
WP	Work Packages
WSW	Water and Sewage Works
WWTP	Waste Water Treatment Plant

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