CHAPTER 13
DRINKING WATER TREATMENTS IN PARTNERS' COUNTRIES

13.1. Drinking Water Treatments in Turkey

There are 25 hydrological basins with a total surface water run-off of 193 billion m3 /year in Turkey as shown in figure 2. (Orman ve Su İşleri Bakanlığı, 2014) 4.9 billion m^3 of water was abstracted from water sources by municipalities to water supply network. Out of this amount, 48.9% was abstracted from dams, 28.3% from wells, 19.2% from springs, 2% from lakes/artificial lakes and sea, and 1.6% from rivers. (TÜİK, Municipal Water Statistics 2012, 2014)

Figure 1. Water Basins

Average amount of water abstracted by municipalities to water supply network was determined as 216 liters per capita per day. In case of three largest cities, amount of abstracted water per capita per day was calculated as 186 liters for İstanbul, 217 liters for Ankara, and 223 liters for İzmir.

Some statistics related with the water resources, transmission, treatment and distribution are given in Table 1.

Table 1. Municipal Water Indicators

Municipal Water Indicators, 2002 - 2012

	2002	2004	2006	2008	2010	2012
Total number of municipalities	3 227	3 225	3 225	3 225	2 950	2 950
Number of municipalities served by water supply network	3 140	3 159	3 167	3 190	2 925	2 928
Rate of population served by water supply network in total municipal population (%)	97	99	98	99	99	98
Total amount of water abstrated to water supply networks by resources (million m^3/year)	4 813	4 954	5 164	4 547	4 785	4 936
Dam	1 796	1 985	1 844	1 810	2 252	2 416
Well	1 455	1 376	1 402	1 276	1 274	1 396
Spring	1 295	1 363	1 380	1 061	1 016	948
River	131	143	305	174	159	78
Lake - Artificial lake/Sea	136	87	233	226	83	98
Amount of water distributed via water supply network (million m^3/year)	...	1 988	2 375	2 401	2 580	2 802
Amount of water treated in water treatment plants (million m^3/year)	1 710	2 079	2 427	2 121	2 520	2 729
Average amount of water abstracted per capita per day (liters/capita-day)	255	255	245	215	216	216

... Data not available.

Above table indicates that, as of 2012 according to the results of Municipal Water Statistics Survey, 2928 municipalities out of 2 950 were served by water supply network. 99% of municipal population is served by a water supply system. In general, 83% of the population (urban 94%, rural 62%) of Turkey has access to improved sanitation, including the households at least having connection to public sewer, septic system or simple pit latrine. (EU Sector Operational Programme, 2014)

Drinking water treatment plants are provided in 346 municipalities, serving 54% of Turkey's total municipal population. TÜİK, Municipal Water Statistics 2012, 2014)

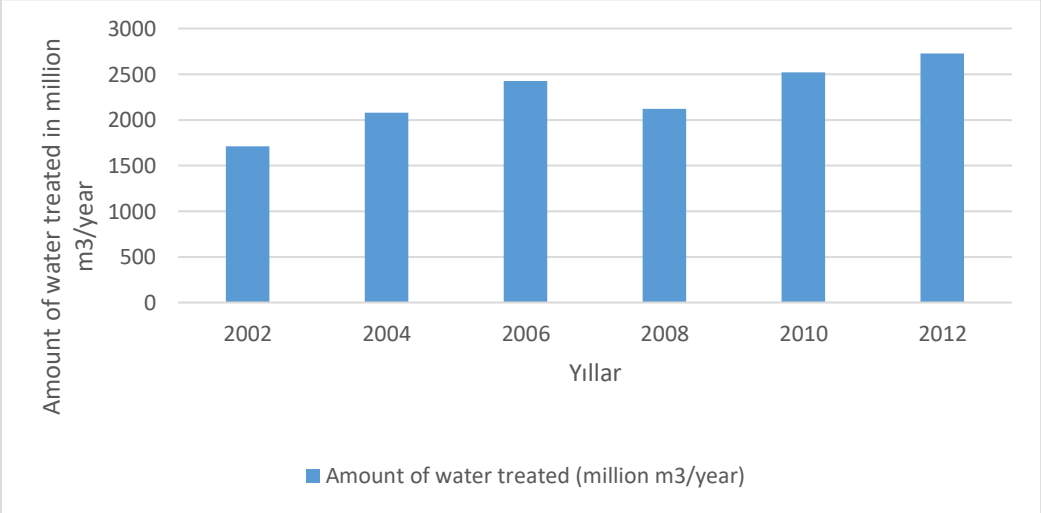


Figure 2. Amount of Drinking Water Treated

As can be seen from Figure 3, **amount of water treated** increased from 1710 million m^3 /year to 2729 million m^3/year for the last 10 years.

Domestic water treatment plants are designed and constructed in accordance with the European standards. The capacities of the treatment facilities constructed vary between 1.600.000 m3/day and 50.000 m3/day depending on the population of the cities. (Adem, et al., 2009)

As of the end of 2011, DSİ has completed 44 water supply projects in operation supplying approximate annual total of 3.31 billion m3 of domestic and industrial water to 34 millions of people. The 32 domestic water treatment plants in 25 cities of above mentioned projects developed by DSİ are being operated by related municipalities. 5,798,788 m 3 /day of water volume is treated in these treatment plants in accordance with European Union standards. 25 cities‟ treatment plants developed by DSİ. After the completion of the construction works, these facilities are transferred to the related municipality.

According to the EU Sector Analysis Report (2014), specific objectives for drinking water quality and treatment are;

- To provide drinking water to the population according to national and EU standards
- To optimize the use of natural resources and to improve the efficiency of the water distribution system
- To reduce the pollution load in receiving water bodies (surface and groundwater) and to protect drinking water systems from contamination;
- To secure efficiency of wastewater treatment plants and to reduce operating costs.

Turkey has been carrying out several water management investment activities during the EU Accession period. Under EOP, out of 32 water management infrastructure projects submitted to the EC, 17 of them are under implementation.

13.2. Drinking Water Treatments in Bulgaria

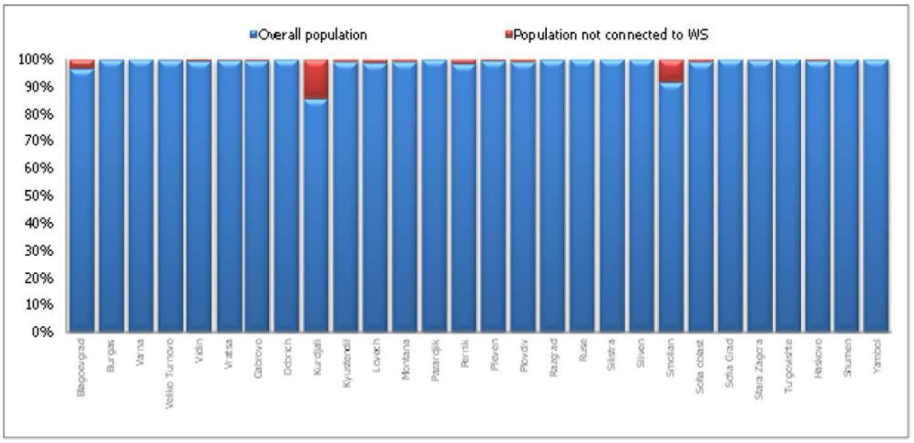
Bulgaria joined the EU on January 1st, 2007 and harmonized its legislation with EC directives implementing Water Framework Directive (WFD) in respect to the main objectives of environment protection, ensuring drinking water supply and other uses, applying environmental standards and regulations. In order to characterize the drinking water sector, the following important issues are taken into consideration:

i. River Basin Management Plans that assure key links between the drinking water and other branches of the sector, including measures for good quality of surface and ground water are developed. In relation to the drinking water sector, the emphasis is given on the construction of wastewater collection and wastewater treatment plants following the Bulgarian and EU

legislation. This drinking water strategy is consistent with the existing River Basin Management Plans.

ii. Bulgarian National Water Strategy and Action Plan for Water Sector Management and Development, which were approved by the Parliament in November, 2012 are outlined. They indicate the overall vision of the water sector, including water resources management, hydropower, flood protection, irrigation, and water supply and sanitation. This defines a more active role of the public authorities in developing and managing the sector.

iii. Water Supply and Sanitation (WSS) Sector, covered by 28 regional utilities or water supply and sanitation companies (WSSC) mainly state-owned, are described (Figs. 3 and 4).



Source: Analysis prepared by the World Bank for the development of the Strategy.

Figure 3: Water supply in Bulgaria by district

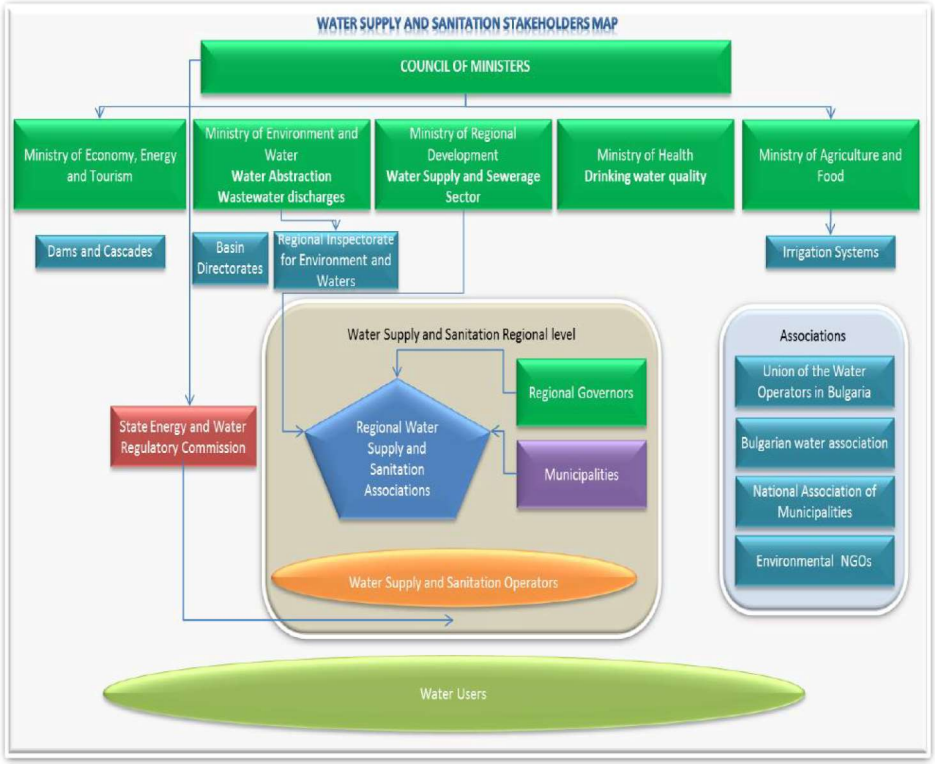


Figure 4. Key WSS sector stakeholders in Bulgaria ("Strategy for Development and Management of the Water Supply and Sanitation Sector in the Republic of Bulgaria 2014 – 2023", Ministry of Regional Development)

iv. EU and national legislation regulatory issues, which describe European and national legislation peculiarities in respect to drinking water, regulations in the water supply and sanitation sector, the public acceptance as a key to the WSS strategy implementation, future trends and goals, and action plans for their implementation, are discussed.

Special attention is given to the PureH2O VET target groups. The vision for the WSS sector development through education at EU/national level is revealed. The following groups are defined and investigated in respect to the VET needs in the PureH2O sector: VET teachers, trainers, learning facilitators, guidance professionals, school/institution managers and political decision makers. Through preliminary scoping, a competence-based system for sectoral qualification is built. It is based on ISCO system and devoted for the key professionals in the areas: Microbiology, Chemistry, Civil Engineering, Environmental Engineering, Electrical Engineering, Mechanical Engineering, Chemical Engineering, Town and Traffic Planning, Education / Vocational Training.

A competence package development is laid down representing a competence map for each PureH2O target VET professional in the water supply sector. Specific needs' analysis for VET requirements in the water sector in Bulgaria is performed and innovative solutions for education of VET targets based on EQF/NQF systems are proposed. For this purpose Bulgarian national qualification framework for lifelong learning (BQF) is discussed: development and introduction of BQF, BQF structure and prospects for implementation. In this respect Bulgarian education and training system and VET structure are commented. On this basis comprehensive information about the number and types of Bulgarian training institutions, programmes and competencies definition is prepared in regards to the PureH2O target professionals.

In conclusion, the need analysis for VET in drinking water sector in Bulgaria outlines the real picture of existing necessities for development of updated knowledge, skills and competence of VET teachers/trainers and other learning facilitators in drinking water supply sector. It is grounded on the basis of the obtained research data in Bulgaria. Therefore, the PureH2O training programme should be organized on the basis of the elements introduced by BQF system (knowledge, skills and wider competencies) and having as a reference the ISCO standards in order to achieve the necessary transparency of the qualifications and to answer the needs of the EU labour market.

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