UNDP GoAL-WaSH Programme:
Governance, Advocacy and Leadership for Water, Sanitation and Hygiene
and
UNDP Human Rights Based Approach (HRBA) to Water Governance Programme.

# BOSNIA AND HERZEGOVINA SECTOR ASSESSMENT

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June 2009

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# A. MDG Outlook and General Situation in Bosnia and Herzegovina

## A.1. MDGs in Bosnia and Herzegovina

According to the last census held in B&H in 1991 there were 4,377,053 citizens. The latest estimation (2007) is some 3,980,000 inhabitants. The urban-rural balance of the population is however changing significantly, which has considerable implications for the overall picture of the state of water supply. Figure 1 displays the ratio of the urban and rural populations for 1990 and 2000 and predictions for 2015 and 2020.

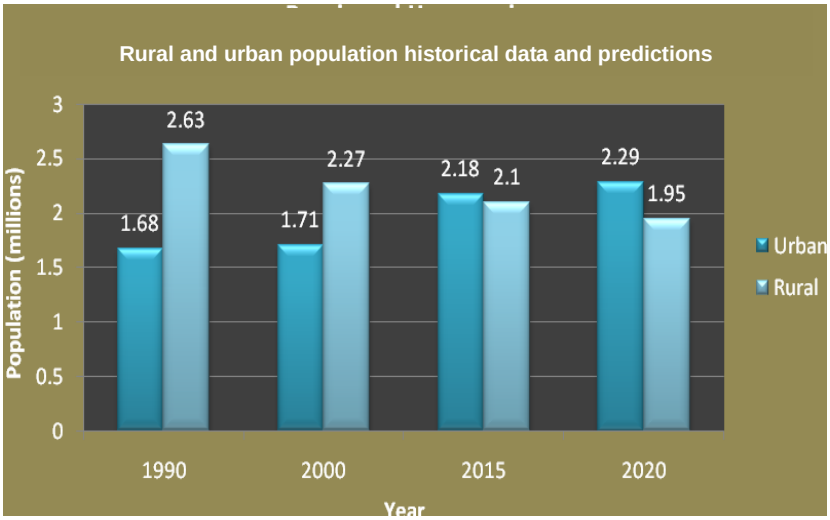



***Figure 1: Ratio of Urban and Rural Population for 1990 and 2000 and Predictions for 2015 and 2020***

*Source: World Bank (2003)*

According to the B&H country delegation report to the General Assembly Thematic Debate held on April 2nd 2008 in New York on progress towards achieving the MDGs by 2015**,** access to improved sources of drinking water and sanitation for B&H is encouraging: about 99% of the population have access to improved sources of drinking water (100% of urban and 98% of rural population). [1] However, there are reasons to doubt these figures. Not only have more recent estimates differed considerably, but there are question marks over the reliability of the statistics (and the precise definitions on which these are based), and the dynamic balance between the different levels of access of urban and rural populations needs to be taken into account.

Figure 2 displays data on access to improved drinking waters sources according to the WHO/UNICEF JMP for Water Supply and Sanitation, updated in July 2008.

[1] Statement, by R. Škrbić, Head of delegation of Bosnia and Herzegovina.

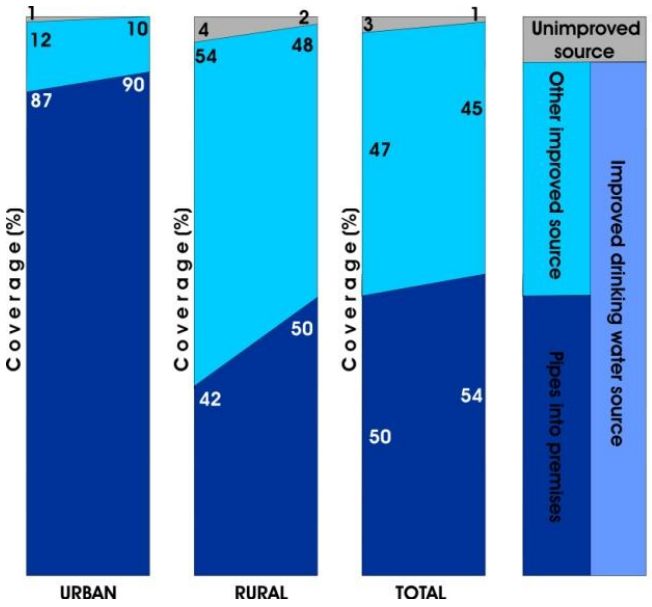



***Figure 2: Bosnia and Herzegovina Drinking Water Ladder 1990-2006***
*Source: WHO/UNICEF (2008) JMP*

Figure 3, indicating the number of water supply connections provided by Public Water Supply Systems in B&H casts further doubt on the 2007 estimates. According to NEAP[2] data, these Municipal (or Public) water utilities cover about 54% of the population in B&H, 56% of the population in the FB&H and about 48% of population in the RS, compared with an average level of over 90% in EU. While it is the case that about 90% of the urban population is connected to the public water supply systems, in rural areas that percent is significantly smaller. The improvement of water supply and sewerage systems are set as priorities within the NEAP.

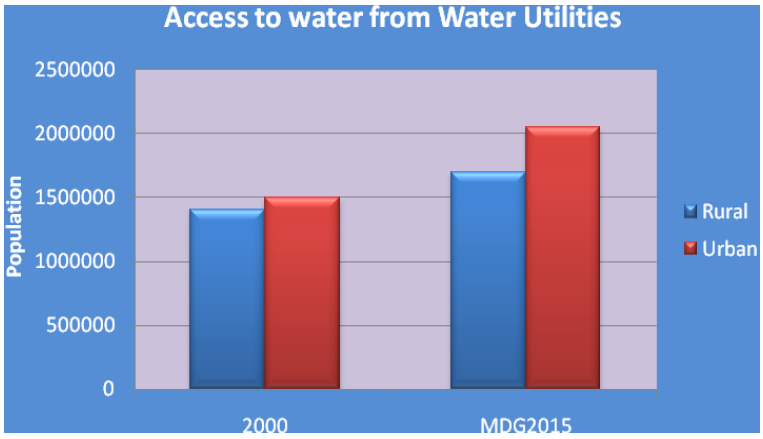



***Figure 3: Population covered by Water Supply from Water Utilities in Urban and Rural areas in 2000 and predictions for 2015*** *Source: World Bank (2003)*

The MDGs for 2015 propose an increase of access to water from water utilities of 35% in urban areas, and 25% in rural areas (Figure 3). According to the WHO/UNICEF JMP Report

[2] National Environment Action Plan for B&H (2003).

for Water Supply and Sanitation (2008), 99% of the total population have access to improved sanitation, whilst it is estimated that open defecation comprises 1% of overall sanitation (Figure 4), (also noted by the country delegation at the General Assembly Thematic Debate on the MDGs for 2015).

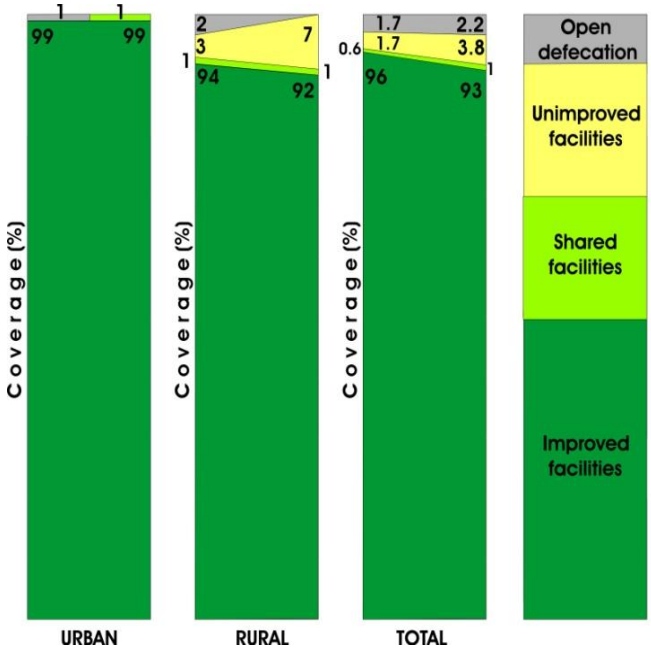



***Figure 4: Bosnia and Herzegovina Sanitation Ladder 1995-2006***
*Source: WHO/UNICEF (2008) JMP*

As in the case of water supply, the major challenges facing access to public sewerage systems provided by water utilities lie in the rural areas. Around 56% of the urban population is connected to sewerage systems; for settlements with more than 10,000 inhabitants coverage rises to 72%, but for smaller settlements this decreases to about 10%[3] . By 2020 an increase of access to public sewers in urban areas by approximately 60%, and by more than 300% in rural areas has been proposed (Figure 5).[4]

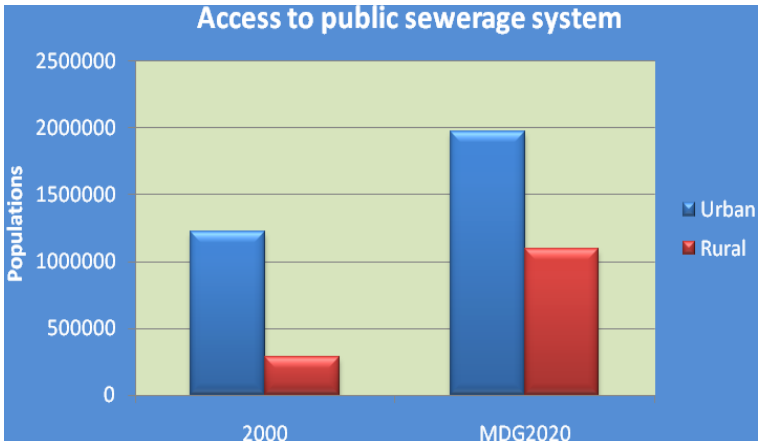



***Figure 5: Population covered by Public Sewerage Systems in Urban and Rural areas***
*Source: World Bank (2003)*

[3] National Environmental Action Plan for B&H (2003)
[4] World Bank (2003), 'The Management of Water Resources in South Eastern Europe'.

The overall picture is therefore bleak, with major challenges ahead in meeting the MDGs, especially in the rural areas.

## A.2. Water Supply Services in Bosnia and Herzegovina

Water Supply services in B&H are under the direct jurisdiction of local governments through the institutions of municipalities, with the exceptions of Sarajevo Water Utility, owned by Sarajevo Canton and the water utilities in Mostar and Banjaluka that are owned by the respective cities. There are approximately 140 municipalities each controlling a public Water utility or other such form of water or wastewater organization. In Brčko District for example, the Water and Wastewater Divisions of the Municipal Utilities Department is in charge of water supply for a range of users (households, public institutions, small business, industries etc.). Consumers not covered by the central municipal water supply systems depend on their own local water supply systems, or on individual wells.

It is estimated that before the civil war (1992-1995) approximately 60% of B&H's population was served by safe water supply systems, including 90% in urban areas and 40% in rural areas).[5] However, due to damage and improper maintenance during the war of the water and wastewater systems, which were predominantly constructed under the former Yugoslavian government, the majority of water supply systems suffer large network leakages today. Owing to the absence of any demographic survey since 1991 the most recent data on the latest safe water coverage ratio is a 'best guest' estimate.

89%[6] of B&H's water supply comes from groundwater, and the remaining from rivers and natural lakes (10.2%), and artificial reservoirs (0.8%). 51% of water is extracted from karst aquifers and 38% from intergranular aquifers (Figure 6). Abstraction from these resources is estimated to be approximately 16$m^3$/s, yet it is estimated35 $m^3$/s will be required for drinking water in 2020[7]. Gross specific consumption in most urban water supply systems ranges from 200 to 600 litres per capita per day.

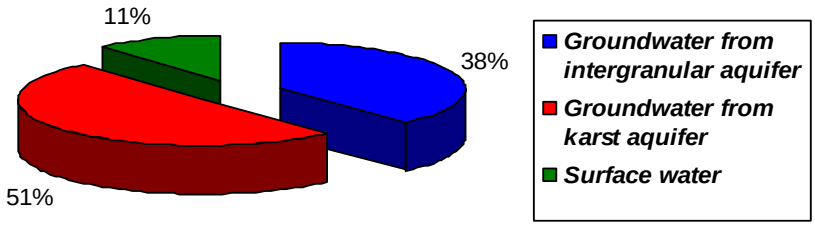



***Figure 6: Approximations of water abstracted from groundwater and surface sources for drinking water supply in B&H*** *Source: MoFTER (2004)*

This forecast also needs to be seen in the light of the fact that in some urban zones of the country the water utilities cannot supply sufficient drinking water during the dry season, when water demand is at its highest. This gap between the medium to long term potential of the

[5] Engineering and Consulting Firms Association Japan et. al (2009) Project Formation Study on Bijeljina Water Supply and Sewerage Study Report.
[6] UNECE (2004), Environmental Performance Review, p.90.
[7] Framework Plan of Water Management Development of the Republic of Srpska (2007).

national water resource and the current inadequate infrastructural capacity is a matter for serious concern. It is probable that the currently fairly regular and serious interruptions to the water supply will worsen.

In the northern parts of the country drinking water comes largely from sandy gravel aquifers in the major river valleys. Drinking water is mostly abstracted from the shallowest aquifer via wells with a depth of 10-50m. The protection of surface streams, which recharge these aquifers, and the protection of the areas of sandy-gravel sediments are crucial for the long term quality and sustainability of the water supply from such groundwater resources. Occasionally, drinking water is provided from deep aquifers in artesian systems.

In the centre and south of the country (which mostly falls within the Adriatic Sea basin), drinking water is mainly abstracted from karst springs, where the minimum discharge is frequently more than $1m^3/s$. The karst aquifers, formed in very fractured and porous limestone with numerous sinkholes, swallow holes, pits, caves, and lost rivers, provide a very specific and extremely rich resource of groundwater. Yet, this water resource is very vulnerable to pollution because groundwater velocity is on average 2-5cm/s, sometimes exceeding 15 cm/s, making the penetration of groundwater easy and rapid. The prevention of pollution of these vulnerable karst zones is the most important factor for the safe long-term water supply to many municipalities in B&H

The protection of drinking water in these zones is currently insufficient and inadequate, and in some cases totally absent. Preventative measures are minimal or non-existent, partly because the treatment of drinking water is a very sensitive issue. Even in cases where treatment of raw water is necessary, it is generally not applied. Chlorination is generally the only measure of water treatment. Furthermore, in some parts of B&H, water resources are not only overexploited, but also extracted in a highly unsatisfactory manner. There are frequent misunderstandings and conflicts over water use and distribution between competing users, contrary to the provisions of the new Entities' Laws on Waters.

### A.2.1. Water Supply in the Republic of Srpska (RS)

The Republic of Srpska is divided into 63 municipalities. Water supply is organized through 51 central municipal Water utility systems and numerous smaller independent water supply systems (smaller village systems and individual systems). Public water utilities cover 46% of the population. The remaining 54% use smaller village systems, personal wells, springs or surface water. It is estimated that RS has 9,800 local or village water supply systems. In urban areas, approximately 87% of inhabitants are covered by Water utility systems. Coverage is especially problematic for Sokolac, Kozarska Dubica, Novi Grad, Ostra Luka, and Knezevo municipalities. By contrast, some municipalities have high coverage of the system but serious water quality problems, such as Prnjavor and in the area along the Sava River.

According to the last significant analyses undertaken in 2000, the level of service and access to potable in the RS is unlikely to meet EU standards until 2025. These standards require 100% of urban and 80% of rural populations to be covered. The RS plans to rehabilitate 50% of existing water infrastructure and provide safe drinking water for all by the year 2010, but given very modest progress had been made by 2005 this is unlikely to be achieved. The lack of recent analysis in this regard, means that are no answers to the questions hanging over the future safety and adequacy of water supply. Indeed, in numerous areas a critical shortfall in both supply and water quality is already reality.

The Republic of Srpska has a population of 1,613,700. Of this number, 741,400 (46%) are covered by municipal water supply systems, 183,700 (11%) by small water supplies owned and operated by a local community, and the remaining 685,100 (43%) use water from small local networks, individual wells or water collected from rivers and springs. Water consumption per inhabitant per year is estimated to be 1300-1500m[38]. Municipal utilities abstract 4$m^3$/s on average, industry uses approximately 150million $m^3$/year of their own sources and about 18million $m^3$ of water from municipal Water utility systems. Further growth in consumption will have to be based on saving, which can only be done by rationing consumption and utilising refined wastewater.

Despite estimates that at least 40% of raw water requires treatment, a very small proportion of water is treated in reality. Inadequate quality control and treatment is seriously threatening human health; it is highly likely that Balkan Endemic Nephritis in the Semebrija region originates from the local drinking water. The construction of intakes and wells, together with pumping facilities, are at present the only significant investment in water systems. The level of service is constrained by a plethora of problems, most notably defects in pipelines causing leakages of up to 80%, defaulting on tariff payments, limited reservoir capacity, and the lack of finance for emergency reconstruction. A third of water enterprises are only able to operate for a maximum of 22 out of 24hours[9]. The inappropriate pricing of water has stimulated further problems. The 2760km long pipeline network is old, mainly constructed in asbestos and cement (now discarded in modern water systems), and extremely liable to cracking and significant (50%+) leakages. Solving these problems is crucial for improving the presently inadequate state of water supply in the Republic of Srpska.

### A.2.2. Water Supply in the Federation of Bosnia and Herzegovina (FB&H)

The FB&H has a population of 2,328,000, 56% of whom have access to the public water supply system managed by water utilities. 94% are connected in urban areas, compared to a mere 20% in rural areas[10], and the remaining population relies on local supply systems or wells. The Federal Statistical Institute collects data on public water supply via annual reports from municipal business entities and water utilities (Table 1).

***Table 1: Public Water Supply System in FB&H*** *(Source: Federal Statistical Institute)*

| Description | **2005** (in 000 $m^3$) | **2006** (in 000 $m^3$) | **2007** (in 000 $m^3$) |
|---|---|---|---|
| **Total volume of water abstracted** | **237.480** | **228.131** | **229.223** |
| **Volume of water delivered to users – total, of which:** | **110.550** | **105.061** | **103.315** |
| agriculture, forestry and fishing | - | 1.284 | 1.548 |
| industrial and construction activities | 24.036 | 20.978 | 20.422 |
| Other business activities | 4.572 | 5.429 | 5.917 |

[8] The Framework Plan of Water Management Development of the Republic of Srpska (2007).
[9] The Framework Plan of Water Management Development of the Republic of Srpska (2007).
[10] Draft Federal Strategy for Water Management in the Federation of Bosnia and Herzegovina (2009).

| | | | |
|---|---|---|---|
| Households | 75.177 | 73.069 | 71.088 |
| Other water supply systems | 6.765 | 4.301 | 4.340 |
| **Total water loss** | **126.930** | **123.070** | **125.908** |
| **Percentage of water losses (%)** | **53,5** | **53,9** | **54,9** |

According to this data, the following amounts of water had been abstracted from various water sources by 2007:

- Groundwater (110.387.000 $m^3$) (48%);
- Springs (80.731.000 $m^3$) (35%);
- Watercourses (27.383.000 $m^3$) (12%);
- Reservoirs (2.444.000 $m^3$) (1%);
- Lakes (1.800.000 $m^3$) (1%);
- Volume of water taken from other water supply systems (6.478.000 $m^3$) (3%).

Urban and rural water supplies both have their inadequacies, largely in terms of stoppages and poor water quality. This is particularly true for the Krka and Cetina river basins (in the west of the country), and in the Bosna and Drina river sub-basins in the north. One of the main reasons for water supply deficiencies in these areas is the loss of water in the pipeline network due to insufficient capacity of the source, and/or unsuitable facilities and equipment for transport, storage and distribution of water, resulting in high percentages of water loss. Some water utilities suffer reduced water supply for 8 hours a day as a result.

## A.3. Sewerage Services in Bosnia and Herzegovina

In B&H, as with most countries in transition, sewerage system development has been slow compared to water supply systems. As with water supply, sewerage services are under the direct jurisdiction of local governments through the municipalities, which own water utilities which operate the centralized sewerage systems. Around 56% of the urban population is connected to sewerage systems, including 72% of settlements with a population exceeding 10,000, but only 10% of smaller settlements. Data supplied by the "The Water Quality Management - second stage (WQM)" project and in the NEAP indicate that only 56% of the total population is connected to centralized sewage systems, while less than 10% of the population is connected to wastewater treatment plants. Accordingly, there are some 160 urban agglomerations and settlements with populations greater than 2,000, totalling 2,384,085 people in 794,695 households, which need to be connected to the centralized sewage systems and wastewater treatment plants.

This situation has arisen for a number of reasons. Firstly, sewerage systems commonly only exist in the central parts of cities, and the urban fringe has come to be served largely by inadequate and inappropriate septic pits, which together with injection wells seriously affect surface and groundwater quality. Secondly, these mixed systems have proven inadequate in terms of their capacity and basic technology over time. As the urban areas have expanded, ad hoc additions to the system have been made, with an ever decreasing capacity to collect and treat sewage. In karst environments, sink holes and surface streams are often used for disposal of wastewaters, leading to pollution of the whole hydrological system and endangering drinking water sources. Moreover, the price of water is well below the operating costs of water utilities. Consequently, water supply systems are deemed of higher priority than

sewerage systems, which are sidelined and insufficiently maintained. It is more than evident that a comprehensive overhaul of the sewerage systems is needed.

Pollution from wastewater is one of the most serious problems in B&H, caused from both human effluent and historical industrial pollution. Prior to the civil war (1992-1995), the industrial core of the former SFR Yugoslavia was located in B&H and most rivers were very seriously polluted with industrial wastewater. Industrial production decreased significantly after 1992, with a consequent diminution in the pollution of surface water, but the long term effects remain. The main culprit was the processing[11] industry, whose daily production of effluents totalled 29.9 $m^3$, representing some 80% of total pollution. Total organic pollution emissions in 1990 had a population equivalent (PE) of 9.5m. Of this a PE of 2.7m originated from human wastewater, and 6.87m PE from industry. The effluent pressure for the whole territory of B&H is now estimated at 10.2m PE, and rising.

The distribution of the effluent load in national watercourses is uneven. The biggest sources of pollution are situated in the Bosna, Vrbas, Una and Sana river catchment areas, and the Sava river basin. Given the high population concentration in the Bosna river basin (Sarajevo, Zenica, Doboj, Modriča etc), it is unsurprising that 68.8% of wastewaters, 58.5% of production of suspended matter and about 36% of total organic pollution in B&H originate here[12]. Large emissions of total organic pollution also originate from the Vrbas (>2.6m PE), the Una and the Sana (1.66m PE), and Sava (>0.97m PE) river basins. As a result, the quality of surface water, especially downstream from the larger settlements, is low (quality classes III and IV). The most polluted rivers are the Vrbas, the Bosna and the downstream section of the Sava. Only the upper parts of the Una, Drina and Neretva rivers maintain good water quality.

The situation is therefore very serious. River basins are dominated by industrial pollution and less than 5% of wastewater is treated before it is directly discharged into surface streams. In karst areas, wastewater is released into natural pits, sinkholes, and underground rivers, preventing these being used for water supply purposes, and the geology of the karst terrain permits the rapid transportation of pollution to springs which may be remote from the original source of pollution. Inappropriate deposal of solid waste is also an additional problem, but major gaps in the database on solid waste deposits mean precise details are unknown.

Since 1995, progress in improving sewerage systems and constructing wastewater treatment plants has been modest. Eight wastewater treatment plants were built before the war, but just one afterwards (in Srebrenik). Only three municipalities in the RS and five in the FB&H (6%) have wastewater treatment plants, but only half of these are currently functioning, and they serve insufficient numbers of inhabitants. Acknowledging that the larger municipalities in B&H have no wastewater treatment at all, the sheer scale of the problem becomes clear. Wastewater purification facilities are largely deficient. Sewerage treatment plants generally have the capacity for mechanical treatment, but not for biological purification, meaning suspended materials are removed, but not organic pollutants. Moreover, plants are inadequately maintained, which is hindering their effectiveness to the point that very few meet the water quality demanded before it is released.

Sanitation facilities in rural settlements are a major problem. Wastewater is bypassed in improvised permeable septic pits, smaller adjacent surface streams or depressions in the terrain. Livestock waste typically ends up in small rivers, polluting these streams with organic

[11] Including metallurgy, leather electrical, tree processing, rubber and plastic, paper and textile industries.
[12] The Framework Plan of Water Management Development of the Republic of Srpska (2007).

content, ammonia and macro elements (N, P etc), leading to eutrophication and long-term pollution of aquatic ecosystems. Wastewater pollution is problematic in medium alluvial river valleys, but more so in karst terrains which have unusually rapid propagation of pollutants.

### A.3.1. Sewerage System in the Republic of Srpska (RS)

The sewerage network in the RS is approximately 1260km long (or about 0.78m per capita)[13]. Wastewater treatments plants are present in Tebinje, Trnovo and Celinac, but only the installation Trebinje is fully functioning. This plant plays a key role in protecting drinking water for the Dubrovnik area of Croatia. A project to install a second plant for the same purpose in neighbouring municipality, Bileca, is due to commence shortly. To reduce pollution as quickly as possible remedial activities are at present mainly focused in the greater urban areas. A number of international projects and initiatives are currently under preparation (for Mostar, Banja Luka, Trnovo, Odžak), or will be implemented shortly (in Bihać, Živinice, Sarajevo).

Urban sewerage systems supply approximately 67% of the population, leaving some municipal centres especially vulnerable with sewerage systems covering a mere 20-40% of households. These include Bijeljina which has more than 100,000 inhabitants, Pale, Bileća, Kotor Varoš, Han Pijesak and Šekovici. A sewerage system is currently under construction in Bijeljina Municipality, co-funded with EBRD, which began in 2007.

Even in the biggest cities in the RS that have centralized sewage systems, such as Banja Luka, Doboj, and Trebinje, there are major sanitation problems. Untreated wastewater in some of the larger settlements in the Republic of Srpska (Bijeljina, Istočno Sarajevo, Gradiška, Novi Grad) threatens drinking water sources. As with water supply, coverage in the sewerage sector (approximately 33%) is considerably beneath the average of EU countries (75%), and their urban areas (67%). Only in 40% of cities in the RS have coverage exceeding 70% (Figure 7).

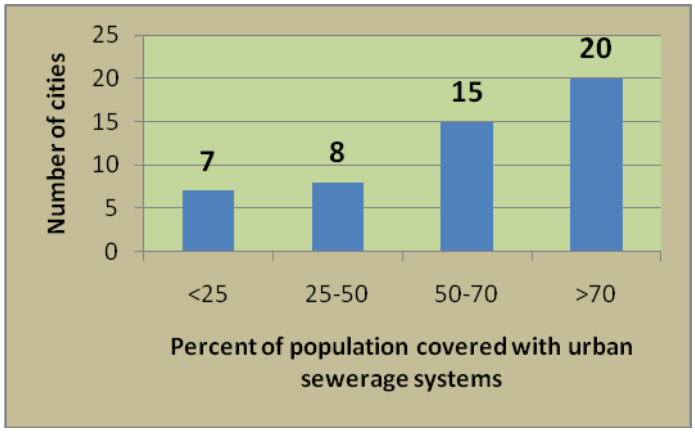



***Figure 7: The Population Covered by Urban Sewerage Systems in RS***
*Source: Republic Directorate for Water of RS (2007)*

Most municipal sewerage systems are of the gravitation (36) or combined type (36). Lacking hydraulic capacity they are unable to cope with frequent storms. Pipes and pumps all need major repairs or replacement, and the current (rather optimistic) plan is to replace 50% by 2010. Less than 10% of the inhabitants covered by sewerage systems also have access

[13] The Framework Plan of Water Management Development of the Republic of Srpska (2007).

wastewater treatment plants. Some plants have hardly functioned over the past two decades, such as those in Trnovo and Čelinac, while in smaller towns (e.g. Milići) the installations are still incomplete.

### A.3.2. Sewerage System in the Federation of Bosnia and Herzegovina (FB&H)

There is no reliable data on the state of sewerage systems in the FB&H. Existing data lacks details on the type of sewerage system, its material, year of construction, and extent of household connections. Providing a detailed quantitative picture of the situation is therefore impossible, besides data from the Federal Statistical Institute displayed in Table 2 and 3.

***Table 2: Collected Wastewaters from different Consumer Categories*** *(Source: Federal Statistical Institute)*

| Description | 2005 in 000 $m^3$ | 2006 in 000 $m^3$ | 2007 in 000 $m^3$ |
|---|---|---|---|
| **Waste water – total, of which:** | **80.073** | **71.049** | **71.189** |
| households | 56.872 | 52.483 | 52.862 |
| agriculture, forestry and fishing | - | 946 | 1.117 |
| industrial and construction activities | 20.784 | 13.013 | 13.455 |
| other activities | 2.417 | 4.607 | 3.755 |
| **Purified waste water - total** | **2.622** | **2.567** | **3.011** |
| **Percentage of purified water (%)** | **3,3** | **3,6** | **4,2** |

***Table 3: Discharged Wastewaters*** *(Source: Federal Statistical Institute)*

| Description | 2005 in 000 $m^3$ | 2006 in 000 $m^3$ | 2007 in 000 $m^3$ |
|---|---|---|---|
| Discharged waste water – total | 80.073 | 71.049 | 71.189 |
| No purified water –total, released into: | 77.451 | 68.482 | 68.178 |
| Groundwater | 1.638 | 973 | 1.233 |
| Watercourses | 72.093 | 65.690 | 66.295 |
| Reservoirs | 3.720 | 1.819 | 650 |
| Purified water - total | 2.622 | 2.567 | 3.011 |

Available data clearly shows the system is dysfunctional, with characteristically low or non-existent levels of maintenance. Most settlements lack integrated systems for collecting wastewater. Sewerage and storm water are usually combined in a mixed system and transported by the shortest possible route to the nearest discharge point, often a river. Households not connected to the sewerage system collect wastewater in leaky septic tanks which contaminate the groundwater, when released into shallowest aquifer, often within the catchment area of pumping wells or springs. Such methods of wastewater discharge are uncontrolled, unsustainable and contrary to sanitation best practice.

FB&H's sewerage network is approximately 2,104 km long. Half the system is combined (storm water and sewerage), and half is separate. The most significant pressures from wastewater originate from settlements with over 10,000 inhabitants, namely: Sarajevo, Mostar, Livno, Konjic, Zenica, Bosanska Krupa, Tuzla, Bihać, Sanski Most, Jajce, Bugojno, Travnik, Novi Travnik, Cazin, Visoko, Vogošća, Lukavac, Kakanj, Živinice, Gračanica, Zavidovići, and Goražde.

There are four wastewater treatment plants in B&H, located in Gradačac and Srebrenik in the Sava river basin, and Ljubuski and Grude in the Adriatic river basin. The wastewater treatment plant in Sarajevo, the capital of approximately 600,000 inhabitants, was destroyed in the civil war (1992-1995) and its reconstruction is still ongoing. Many of the wastewater treatment plants that were operational before the war or are in the final phase of construction do not function. This is the case for wastewater treatment plants in Sarajevo, Trnovo, and Odžak in the Sava river basin, and in Široki Brijeg and Bosansko Grahovo in the Adriatic Sea basin.

## A.4. The Situation regarding the 'Right to Water'

The Human Rights Based Approach (HRBA) to development identifies rights-holders and their entitlements, and duty-bearers and their obligations and analyses the relationship between them. In B&H's water sector, duty-bearers comprise the water utility companies and all government levels in the complex politico-administrative system (see Figure 10). Rights-holders comprise every individual in the country whatever their gender, race and ethnicity; each person has a right to reliable access to clean and affordable potable water. The 'right to water' does not mean free water, or allow for unlimited use of water, nor entitle everyone to a household connection or to water resources in other countries. Rather, a 'right to water' means an affordable water supply providing sufficient water for personal and domestic uses, located within, or in close proximity to the household.

In B&H, weak governance and degrading infrastructure are impeding duty-bearers from fulfilling their water service delivery obligations to rights-holders in a satisfactory manner. The situation is worse for vulnerable and marginalised groups in rural areas. Rural areas are typically not connected to a centralised water supply system, but rely on small village water supply systems not under national control that typically comprise of private wells, unprotected wells and springs.

### A.4.1. 125,000 IDPs in need of access to water and sanitation

The capacity of these unimproved water sources is being overwhelmed by the large returnee population. Approximately 125,000 internally displaced persons (IDPs) diffuse throughout the country do not have reliable access to sufficient, affordable, potable water. Municipalities with the most IDPs include Sarajevo (23,665); Banja Luka (12,627); Bijeljina (7,401); Tuzla (7,015); Prijedor (6,776); Zvornik (6,776); Doboj (5,222); Modrica (4,656); Zivinice (4,093)[14]. Without an official place of residence with a building licence, access to clean, safe water cannot be granted. For sustainable returnees, the houses and infrastructure they return to generally lacks maintenance, partly due to civil war (1992-1995) destruction, and partly because few measures have been taken to rehabilitate and maintain the buildings ever since.

[14] Internal Displacement Monitoring Centre data (http://www.internal-displacement.org/)

'Minority returnees are discriminated against in almost all sectors of life, including...water supply, electricity and communications' (IDMC, 2008:255). The Roma population of approximately 60,000 are also marginalised. Many live in informal settlements that lack basic facilities, including insufficient access to potable water[15]. Furthermore, access to drinking water within/in close proximity to schools in rural areas, and within/in close proximity to the housing unit of disabled persons is limited compared to that for other persons[16]. Efforts to create the necessary conditions for returnees, by combating discrimination against those from minority groups and ensuring equal access to affordable, potable water are needed. Addressing returnees and other vulnerable persons deprived access to utilities was considered a high priority by the Human Rights Task Force in January 2000[17]. However, despite the problems being well-documented in information provided by legal aid centres and the Ombudsman's office, little effective action has since been taken to prevent abuses and arbitrary measures, or to monitor the situation on the ground.

### A.4.2. Lack of knowledge and public awareness

A lack of civil society awareness regarding their water rights and the process through which they can claim their rights and hold duty-bearers to account poses an obstacle to improving the situation. A large percentage of the population are unaware they have a right to affordable, safe potable water. Those that are aware are typically unaware of the redress mechanisms available to them when their access is denied. Some complaints are made to the Ministry for Human Rights and Refugees regarding access to water, but these are overwhelmingly lodged by persons in urban areas. Registered cases and claims submitted to the Ombudsman regarding the water sector highlight the two biggest problems in terms of the right to water to be a lack of knowledge and public awareness. Moreover, justice in access to information is infrequently met, water-relevant information is hard to obtain.

To date, the majority of projects in B&H's water sector have been infrastructural. Very few have adopted a 'soft' approach to development, and only UNDP's Rights-based Municipal Development Programme (RMAP) has explicitly utilised the HRBA. RMAP facilitated local development planning in selected municipalities in B&H through a multi-sector approach guided by international human rights principles and standards. The RMAP highlighted the difficulties in having a programme fully guided by a normative framework, such as international human rights principles. The experience suggests the normative framework should be used as guidance, and a pragmatic, context-specific approach adopted. UNICEF and UNDP's Joint Programme entitled 'Economic Governance: Securing Access to Water through Institutional Development and Infrastructure' (2009-2011), bridges both the infrastructural and HRBA to improving water governance in B&H. It aims to directly contribute to the first two UNDAF outcomes: 1) Strengthened accountability and responsiveness to pro-active citizens (integral to the HRBA), and 2) Improved access to and quality of basic education, health and social protection services[18]. There are evident opportunities to integrate the suggested GoAL-Wash/HRBA UNDP interventions with this existing programme (see Project Components document).

[15] IDMC (2008), 'Bosnia and Herzegovina: Broader and improved support for durable solutions required', p228.
[16] UNDP (2007) 'National Human Development Report 2007: Social Inclusion in Bosnia and Herzegovina'.
[17] UNECE (2001), 'Situation of human rights in the former Yugoslavia'.
[18] UNDP/UNICEF (2008) Joint Programme Document

### A.4.3. Weak civil society Human Rights structures

Environmental NGOs are generally not active in the cross-cutting areas of water governance and human rights. Most NGOs in B&H have been set up to deal with the housing crisis and returnees following the civil war (1992-1995), but very few explicitly deal with human rights issues. Those that do are concerned with first generation human rights that are fundamentally political and civil in nature, not third generation social and economic rights, which include the right to natural resources amongst others. Nevertheless, NGOs and national stakeholders are welcoming the HRBA as a new and innovative method for improving water governance in B&H.

### A.4.4. Legislative Framework

B&H has also signed or ratified the following international human rights conventions and regional instruments relevant for the HRBA to improving Water Governance:

- **International Covenant on Economic, Social and Cultural Rights (1966)** (ratified 6th March 1992);
- **Convention on the Rights of the Child (1989)** (ratified 6th March 1992);
- **Convention on the Elimination of all forms of discrimination against women (1979)** (ratified 1st October 1993);
- **Convention Against Torture and other Cruel, Inhuman or Degrading Treatment or Punishment (1984)** (ratified 06 March 1992);
- **International Convention on the Elimination of all forms of Racial Discrimination (1965)** (ratified 16th July 1993);
- **UNECE Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (1998)** (accession October 2008);
- **Kiev Protocol on Pollutant Release and Transfer Registers (2003)** (signed 21st May 2003);
- **Council of Europe Convention for the Protection of Human Rights and Fundamental Freedoms (1970)** (ratified 12th July 2002);
- **Council of Europe Framework Convention for the Protection of National Minorities (1995)**.

The Constitution includes most of the principles of these human rights conventions and guarantees that they supersede national legislation. As it stands, the legal framework for ensuring the right to water appears sufficient on paper, the challenge lies in improving its implementation in reality. Improvement is needed in the implementation of rulings and international human rights conventions[19]; largely because the institutional and administrative bodies needed to ensure the legislation is adequately enforced, are embedded in a complex politico-administrative system lacking harmonization and clearly defined responsibilities.

At present B&H is neither a signatory nor party to:

- **UNECE Convention of the Protection and Use of Transboundary Waters and International Lakes (1992);**
- **Convention on the Transboundary Effects of Industrial Accidents (1992)**; or
- **UNECE Protocol on Water and Health (1992).**

[19] See Commission of European Communities Progress Report for Bosnia and Herzegovina 2007, p.16.

UN Treaty bodies have made recommendations for improving the human rights situation in B&H. It is recommended that the State party ensure the independence and impartiality of the Office of the State Ombudsman, and adopt one common human rights approach[20]. With regards 'the right to water' specifically, the Committee on Economic, Social and Cultural Rights (CESC) suggest the State party identify disaggregated indicators and appropriate national benchmarks in relation to the right to water, in line with the committee's General Comment No.15. The CESC request the state includes information on the process of identifying such indicators and benchmarks in its next report[21].

## A.5. Main Issues to be Addressed

### A.5.1. Policy, Institutional Fragmentation and Transboundary Cooperation

The institutional structure in Bosnia and Herzegovina is complex, with two entities (FB&H and RS), 10 Cantons within FB&H, and municipalities. As a result, responsibilities for water management and policies exist at numerous government levels (entity, canton and municipality), which poses operational and planning constraints. The two entities (RS and F B&H) are each responsible for elaborating their respective Water Laws and Water Management Strategies, but these need to be harmonised further. Great progress has been made in cooperation between entity Ministries and Water Agencies, especially in the last seven years or so in water sector reform and water quality and quantity monitoring, but there remains room for improvement.

B&H's strategic goal is to join the European Union. A variety of activities are occurring in preparation for the accession, including the signing of the Stabilization and Association Agreement with the EU, which occurred in June 2008. Whilst presently not a member of the European Union and thus with no formal obligation to implement the EU regulations, B&H, with its two entities, intends to implement the EU Water Framework Directive (WFD). This intention is explicit in the signature of Memorandum of Understanding within the national CARDS project "Institutional Strengthening of Water Sector in B&H", signed between the Delegation of European Commission in Sarajevo and Council of Ministers of B&H, and Entity Governments, with the goal to: "harmonize, finalize and approve the reform of water sector in Bosnia and Herzegovina, based on principles and goals of the WFD (2000/60/EC)". Within this project, new Water Laws (2006) for both entities were elaborated incorporating basic principles of the WFD. Given the differences in entity Water Laws, the extent of WFD transposition into these laws similarly differs, with 83% into FB&H water law and 97% into RS water law.[22] The goals of EU accession and implementation of integrated water resources management (IWRM) are thus well-accepted by both entities.

Implementation of legislation remains a big issue, and the legislation itself is lagging far behind needs and plans. Both entities' Water Ministries are currently working on creating secondary water legislation, and it is anticipated that a EC "Water Policy" project will begin to be implemented soon, which will present a crucial step towards the development of secondary (subordinate to international) legislation. Moreover no overarching water policy

[20] E/C.12/BIH/CO/1, Concluding observations of the Committee on Economic, Social and Cultural Rights, para 30.
[21] E/C.12/BIH/CO/1, Concluding observations of the Committee on Economic, Social and Cultural Rights, para 49.
[22] COWI (2007), 'Reports on Progress Monitoring for the countries of South East Europe (pre-candidates)'.

exists in B&H at present, and water management strategies at the entity level and river basin management plans (e.g. for the Sava and Adriatic basins) have not been sufficiently elaborated. However, FB&H is currently in the final stage of preparing a Water Governance Strategy, expected to be adopted by the end of 2009, and RS has elaborated the "Framework Plan for Development of Water Management" (2006); a crucial step towards developing a Water Management Strategy in RS.

Whilst statistics from the WHO/UNICEF JMP, and statements by the B&H delegation at the General Assembly in 2008, indicate that B&H has already achieved its MDG7 target, the real situation is basically far from satisfactory. Slow reform processes have left gaps in the delivery of social services, notably including water supply and sewerage. At the municipal level USAID has been working since 1998 to strengthen the institutional and financial capacity of municipal water utilities to the extent of achieving financial sustainability and operational efficiency necessary to qualify for commercial credits from the World Bank and other donors. Significant numbers of water utilities have received technical assistance in management and operational strengthening of their companies, and have greatly improved their efficiency and managerial capabilities as a result. However, further development in the sector is limited by a lack of funds for infrastructural investment, which would ensure B&H has adequate and sustainable water and wastewater services.

B&H hopes to improve transboundary cooperation with neighbouring countries, especially in terms of pollution of transboundary waters. In 1996, the country signed a bilateral agreement with Croatia on Water Management Cooperation, but its implementation in practice remains a challenge. With serious threats to many regional water supply catchments and pollution of transboundary water courses, dialogue and collaborative action with neighbouring country representatives needs to be intensified. The lack of qualified staff in Government and local institutions is an additional problem, and improvement in this regard is vital for bringing about comprehensive and sustained improvements in the water sector.

### A.5.2. Financial Constraints

According to the water entities' Laws (FB&H and RS) funds for improvements in the water sector are ensured through "general" and "special" water fees in the FB&H, and "special" water fees in RS (see section B.1.5).
In the FB&H, these charges/fees are divided among the following institutions:

- 40% to the relevant Water Agency;
- 45% to the Canton; and
- 15% to the Environment Protection Fund.

In RS, the division of charges/fees, except for item d. charges 1), 2), 3), (see section B.1.5) are as follows:

- 70% for special water purposes;
- 30% for local authorities.

Item d. charges 1), 2), 3), (see section B.1.5) are divided into:

- 55% for special water purposes;
- 15% for environment protection in RS;
- 30% for local authorities.

Insufficient funds for covering costs are a grave problem in the water sector. On some occasions, revenues from water fees have inadequately used, ending up in RS Government budget and not the water agencies dedicated to improving the sector. Water utilities are

typically financially dependent of their own revenue collection. Most small-sized Water utilities only manage to cover basic operation and maintenance (O&M) costs incurred from consumer tariffs. In larger municipalities, the situation is worse; utilities are typically unable to cover even these costs from revenue collection.

The weak financial situation of most water utilities does not allow for preventive maintenance to be performed at the levels required to prolong the life of existing facilities. Due to constrained financial resources, water utilities can only undertake network repairs in cases of absolute urgency, meaning the many needs that arise due to the ageing infrastructure cannot all be met. Nevertheless, operators are putting all their efforts into delivering their services as efficiently as possible, and are generally successful in maintaining a 24hour water supply of adequate quality.

The lack of funds for water utilities is largely attributable to their lack of autonomy and dependence on municipalities, which are typically not in favor of increasing tariff rates. Throughout history, the price of water has been utilized as an instrument for social peace and a political weapon, and the same holds true today. Inadequate organizational structures and capacities within Utilities are party also to blame for insufficient funds. The B&H Water Utilities Association emphasised the following operational problems leading to financial problems:

- Huge consumption of water per capita per day;
- Inadequate water consumption calculations;
- Insufficient level of revenue collection and improper use of those that are;
- Ineffective budgeting and planning systems;
- Inappropriate price of water; and
- Difficulties managing water utilities due to multiple services within the same Water Utility (e.g. water supply, wastewater treatment, solid waste, etc).

### A.5.3. Inadequate Local Authority Capacities (Municipalities and Water Utilities)

A lack of local level capacity (in first order) and resources (second) to develop and deliver effective services is a significant constraint in municipalities. Water supply and sanitation are frequently neglected in local communities. Solving water and sanitation problems are typically deemed secondary to all other infrastructure problems (e.g. buildings, electricity supply etc). Increased investment in the water and sanitation sector and appropriate municipal budget planning for this purpose is crucial to satisfy drinking water and sanitation demands.

The larger water utilities generally have sufficient skilled employees and are equipped with the necessary equipment, but the smaller sized utilities are frequently facing problems. These include weak organizational structures; lack of skilled professionals; limited staff capacities in terms of computer use, and a lack of basic equipment for network mapping, leak detection, accounting, water quality monitoring and metering.

### A.5.4. Outdated Sector Assessment and Weak Monitoring Systems

Ever since the end of the civil war in 1995, sector monitoring systems involving collection of data about abstracted water, consumption, losses, finance flow etc have been modest, and information pertaining to the water sector in B&H are generally unreliable. Currently available data that water utilities are providing to central institutions (Ministries or Water

Agencies) on the level of services (water abstraction, consumption, losses etc.) are arbitrary, inaccurate and frequently lead to wrong conclusions.

However, improvements are underway in the form of a GIS based Water Information system (ISoW) for both entities, which will serve as a "backbone" for gathering sector information for an updated sector assessment. Information on financial flows remains an urgent priority, as such information, crucial for sector decision-making, exists at neither entity nor national levels. Together with sector monitoring, the WFD requires establishment of surface and groundwater quality and quantity monitoring. Monitoring systems for surface waters have been re-established in B&H from 2004 onwards. Water agencies installed about 70 automatic measuring stations in the whole territory of B&H, and continuously observe the prescribed parameters for quantity and quality in accordance with the European Water Framework Directive. In addition, the WFD requests integral monitoring to be established in 2009, but actions in this respect are limited in B&H, and this process will evidently be delayed. The estimated 600,000 euro/yr for such water monitoring in B&H poses a real challenge given the available finances of Water Agencies.

### A.5.5. Water Quality and Treatment of Drinking Water

Drinking water quality problems in Karst areas and surface intakes are largely due to turbidity and bacteriological contamination. Turbidity is especially problematic in spring months, after snowmelt and intense rains, and often exceeds 100 NTU (Nephelometric Turbidity Unit); a level at which the water becomes undrinkable. Installations for treating water turbidity are rare in B&H. Bacteriological contamination is largely attributable to human activities (the absence of wastewater treatment facilities in urban areas, septic pits in rural areas, farms etc), and the presence of chemicals (Fe, Mn etc) are problematic in water captured from aquifers in big river valleys. However, springs mostly satisfy the requests of domestic regulation, which is harmonized with WHO requests for drinking waters and the EU Directive on drinking waters.

Drinking water quality monitoring is inadequate, occurring mostly in water utilities, while local and individual systems control is comparatively worse. Treatment is largely through chlorination of raw water, but this has varying results. Sometimes the presence of bacteria (most frequently faecal originate: species Escherichia, Streptococcus, etc.) exceeds allowed values post-treatment, and residual chlorine borders allowed values. Large water supply systems, such as Banja Luka waterworks, are now seriously considering alternative suitable methods to solve bacteriological contamination (e.g. ozone application), as besides disinfection other treatment methods are currently very rare.

### A.5.6. Sewerage Systems and Wastewater Treatment Plants in Cities and Settlements of up to 10,000 inhabitants

The number and standard of sewerage systems and wastewater treatment plants in B&H is unsatisfactory. Attention to these problems has been predominantly focused in the bigger cities (Sarajevo, Banja Luka, Mostar, Zenica, Bijeljina etc), with inadequate attention being paid to smaller settlements of up to 2,000, and from 2.000-10.000 inhabitants, which comprise 20% of the total population. Settlements with 2,000+ inhabitants typically lack sufficient drinking water treatment and sewerage connections. Those that are connected to the sewerage system, are generally without wastewater treatment facilities meaning untreated effluent is discharged into streams, with serious threats to human health. The Government is fully aware

of the present dangerous situation with regards direct discharging of wastewater from smaller urban areas, and calls for a strategy and an activity plan to be developed to reduce the negative impacts.

**Key Measures to Improve Wastewater Treatment in Small Cities**

- Emphasize the significance of drinking water quality control and treatment of drinking water, wastewater collection and treatment, in settlements with up to 10,000 inhabitants;
- Conventional drinking water treatment facilities and wastewater treatment plants are too much expensive for small settlements. Possibilities for alternative low cost wastewater treatment facilities that are easy to maintain, extend and upgrade and have low energy consumption should be researched.
- Scale-up other projects under implementation such as the GEF Water Quality Protection Project for B&H. This Project focuses on the Neretva and Bosna rivers and aims at substantial pollution reduction of both rivers, and similar projects should be started for other river basins (Una, Sana, Vrbas, Drina, Cetina, Direct Sava basin).

### A.5.7. Ensuring each individual's right to water

Public awareness surrounding their water rights and responsibilities is low and needs to be raised, and NGO and CSOs capacity to deal with human rights needs strengthening, specifically with regards the right to water. To ensure each individual's right to water is met, IDPs and rural areas need to be prioritized in efforts to increase access to safe water and sanitation. Additionally, the procedural rights of transparency and participation need to be improved, by inter alia, improving civil society's access to relevant information and better facilitating their participation in related decision making. To further ensure *every individual* has access to safe potable water and sanitation, the Protocol on Water and Health (1999) to the UNECE Convention of the Protection and Use of Transboundary Watercourses and International Lakes (1992) which entered into force in August 2005 needs to be promoted. It should be suggested that B&H's government ratifies the convention and protocol due to the benefits brought about by being a party.

## B.1. Sector Preparedness Overview

### B.1.1. Relevant Policy and Strategic Documents

B&H has developed two strategic Documents relevant to the water sector; a National Environmental Action Plan (NEAP) (2003) and a Mid-Term National Development Strategy (NDS) (2003) for the period 2004-200 (see Annex 3). The national documents look good on paper. NEAP identifies water management as one of the priority environmental issues in B&H, and the NDS emphasises the sustainable development of water management requires increased attention and action. However, their implementation remains wanting. The strategies and organisational structures for monitoring and managing water supply prescribed have only been partially (approximately 56%) realised.

According to the new entities Water Laws, entities' Ministries for water are responsible for producing Water Management Strategies**.** A Water Strategy for the FB&H is in the final stage of production (see Annex 3), whilst a strategy for RS has not commenced production. It is therefore not yet possible to evaluate the effects of their implementation.

**Key Measures to Improve Policy and Strategic Documents**

The national strategies and policy framework are of an acceptable level, but many of their elements have not been implemented and there are large gaps between theory and practice. Furthermore, whilst entity Water Laws are harmonised with the WFD (EU/2000/60) and present an essential foundation for synchronised water management across entities, the laws are not supplemented with implementing regulations or by-laws, which would provide the operational and technical guidelines necessary for their effective application and enforcement.

Key measures for improvement are:

- Begin/accelerate the creation of secondary water legislation documents;
- Further harmonize domestic policy with EU policy;
- Accelerate the production of RS's Water Management Strategy. At present there is no indication of dates for finishing this essential document;
- Speed up activities on preparation and completion of River Basin Management plans, currently scheduled for completion in 2012 (FB&H) and 2015 (RS); and
- Enhance inter-sector coordination, by harmonizing water sector strategies with other strategies (e.g. local governance strategies, spatial entities plans, and agriculture policies etc).

### B.1.2. International Cooperation

The transboundary character of surface and groundwater in the territory of B&H presupposes water management can be provided through the international cooperation with clearly defined criteria and responsibilities. International obligations request B&H to cooperate actively with international bodies, such as:

- The International Commission for the Protection of the Danube River (ICPDR);
- Interim Commission for the Sava River Sub-Basin (The Sava Commission);
- EU – as a country aiming for EU accession, B&H has to align its regulations pertaining to environmental protection and the protection and management of water to the EU official legislature; and
- The UN – as a member of the UN, B&H is obliged to build into domestic legislation key requests derived from relevant UN conventions, directives, and recommendations.

B&H is a member or contractor the following conventions and agreements related to transboundary water:

- **Danube River Protection Convention (1994)** - Since 1996 B&H is actively involved in the work of expert teams of the Danube River Protection Convention (representatives in the ICPDR and expert groups). B&H ratified the convention in January 2005 (Official Gazette B&H 1/05).
- **Convention for the Protection of the Mediterranean Sea against Pollution (1976)** (Official Gazette B&H, No 26/98) and its Protocols:
    1. Protocol for the protection of the Mediterranean Sea against pollution from land-based sources (1980) (Took effect on: 17.06.1983);
    2. Protocol concerning Mediterranean Specially Protected Areas (1982) (Took effect on: 23.3.1986.);
    3. Protocol for the prevention of pollution of the Mediterranean Sea by dumping from ships and aircraft (1976) (Took effect on: 12.02.1978.);

4. Protocol concerning co-operation in combating pollution of the Mediterranean Sea by oil and other harmful substances in cases of emergency (1976) (Took effect on: 12.02.1978).

B&H has been actively involved in the work of Mediterranean Action Plan since 1998.

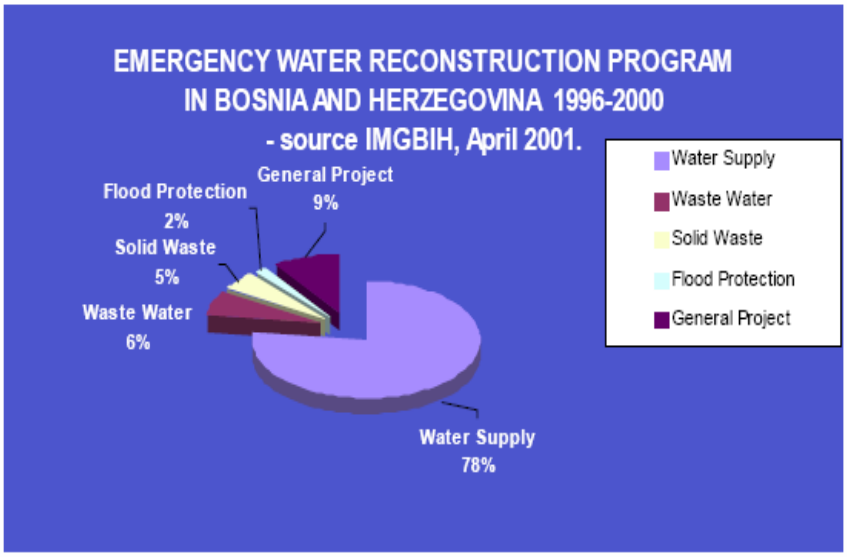
- **International Convention for the Prevention of Pollution of the Sea by Oil (1954)** (Took effect on: 26.07.1958.) (Official Gazette RB&H No. 13/94, Official Gazette SFRJ IA No.60/73, 53/74).
- **International Convention for the Protection of Pollution from Ships (1973)** (Took effect on: 02.10.1983.) (Official Gazette RB&H No. 13/94, Official Gazette SFRJ IA No.2/85).

B&H is preparing for ratification of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (1992) and the Convention on the Transboundary Effects of Industrial Accidents (1992), in which cooperation with neighbouring countries (the Republic of Serbia, the Republic of Montenegro and the Republic of Croatia) is important.

There are also projects aiming to enhance transboundary cooperation. A GEF-UNDP-UNESCO project named "Equitable and Sustainable use of Dinaric Karst Aquifer System" (DIKTAS), one of the biggest aquifer karst systems in the world, is in the preparation stage. The project emphasises equitable and sustainable use of water resources (especially groundwater) and institutional cooperation between parties, which currently include Montenegro, Albania, Croatia, and B&H (Serbia is expected to join soon). Also significant is the World Bank, B&H and Croatian common funded Project "Managing of the Neretva and the Trebišnjica rivers". The Contract between the World Bank, and the Government of Croatia, the FB&H and the RS, and the Memorandum of understanding between B&H and Croatia were signed in 2008. The total project grant was US$8million, of which US$6million is dedicated for B&H, and US$2million for Croatia. The project should cover issues of water allocation, preservation of ecosystems and biodiversity, as well as the reduction of pollution from sewerage systems in B&H and Croatian settlements and industries.

### B.1.3. Aid in the Water Sector: The Post War Period

Direct damages to the water sector from the civil war (1992-1995) were estimated at US$300 million, with US$ 950 million needed for urgent rehabilitation and upgrading work. Ever since, a considerable number of projects were carried out directly with municipal authorities that were predominantly infrastructural in the water sector. As some projects were implemented at the local/municipal level, it is possible the following diagrams depicting total number of projects 1996-2000 underestimate the true total on the ground.



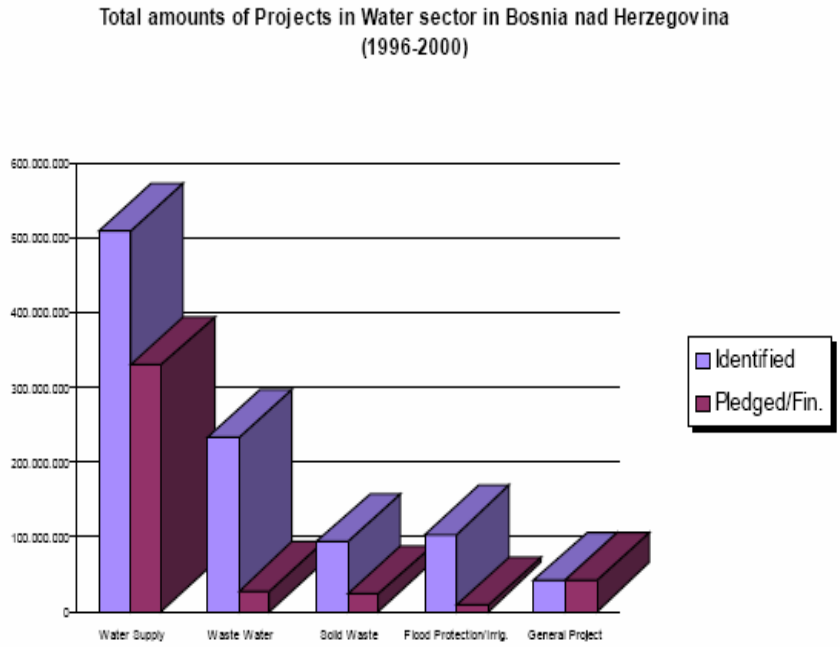




***Figure 8: Relevant Aid Data (1996-2000)***[23]

When the war ended in 1995, the international community and local authorities in B&H initiated a Reconstruction and Development Program for the Water Sector. During this time, the majority of laws, strategies, and institutional strengthening in water sector were implemented with help of international institutions, EU and USAID funds (mainly) and aid policies. The EU's focus was on institutional strengthening at the national level, whilst USAID concentrated on the local level and strengthening water utilities capacities. Crucial support also came from the World Bank, EBRD, and donor countries (Sweden, Norway, Italy, Japan, Austria, Germany, Spain inter alia.).

[23] Source: Conference of the Water Directors of the Euro-Mediterranean and SEE countries, Bosnia and Herzegovina Country Report, prepared by Damir Mrden.

The EU has been the lead donor for water sector reform since 1998. Key features of this assistance have been support to integrated water resources management (IWRM) based on the river basin model and assistance preparing and implementing water legislation in line with the EU WFD. This has led to the creation of harmonised entity-level Water Laws, drafted through a consensus-building process with relevant stakeholders, which have been adopted in both entities and enacted in one to date. EU assistance has further helped develop a national Water Information System with a Geographic Information System (GIS), supply needed hardware and software and train specialists in its use. Currently, the EU is assisting the preparation of the "B&H Water Management Quality Plan", addressing the urgent need to prioritise investment in municipal wastewater treatment infrastructure to improve the quality of surface water (see Annex 4 for further information on successful projects implemented in the last few years with ODA).

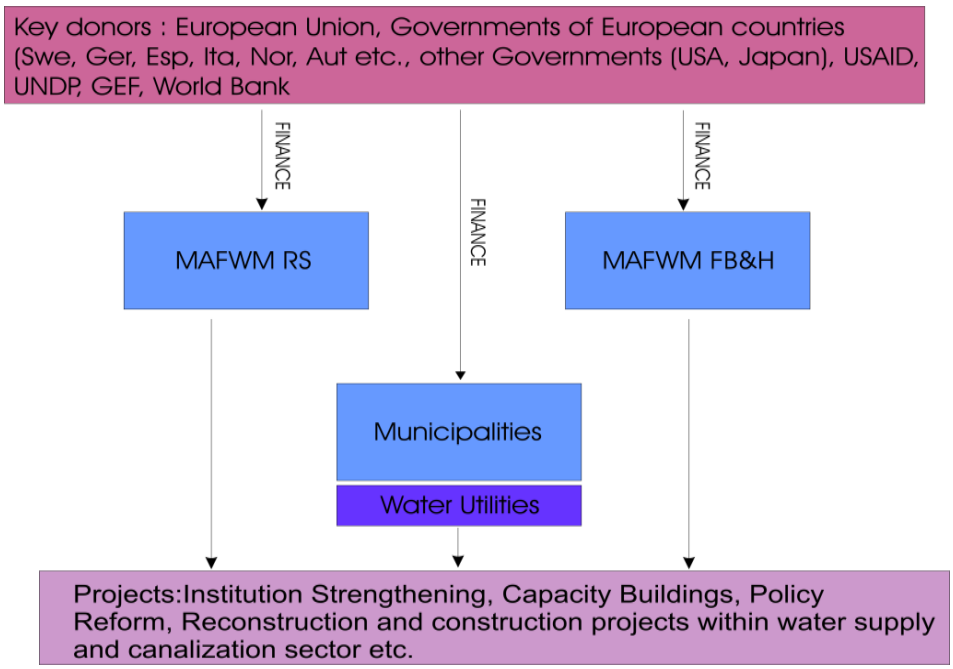



***Figure 9: Aid Coordination Graph***

**Key Measures to Improve Aid**

- Educate staff in relevant institutions at national, entity and municipality level and in NGOs about possibilities to approach available EU and other international funds accessible to B&H. Develop capacity building programs for making applications for relevant programs and projects;
- Use funds from local development agencies for supporting water supply and sewerage projects;
- Disseminate information toward responsible institutions and publish appropriate guidance on funds available to B&H from EU/international funds. 330 million euro is available, predominantly for institutional building and transboundary cooperation (very important for B&H).

### B.1.4. Institutional Framework of Water Sector

At the state level, the Ministry of Foreign Trade and Economic Relations of B&H is responsible for coordination of activities and harmonization of plans between bodies of entity governments as well as the institutions at international level in the field of natural resources, environment protection, agriculture and energy. The Ministry of Communications, also at the state level, is in charge for navigation on rivers and sea. According to the Constitution, water management is in the competence of two entity Ministries of Agriculture, Water Management and Forestry (one in the FB&H, other in the RS), and the Water Agencies. In accordance with the Laws on Water there are four Agencies in B&H responsible for water management; two are situated in RS and two in the FB&H. In every entity one Agency is responsible for water management in the Black Sea basin (in the RS situated in Bijeljina, in the FB&H situated in Sarajevo) and the second for water management within the Adriatic Sea basin (in the RS situated in Trebinje, in the FB&H situated in Mostar). These agencies are under the jurisdiction of the entity Ministries of Agriculture, Forestry and Water Management.

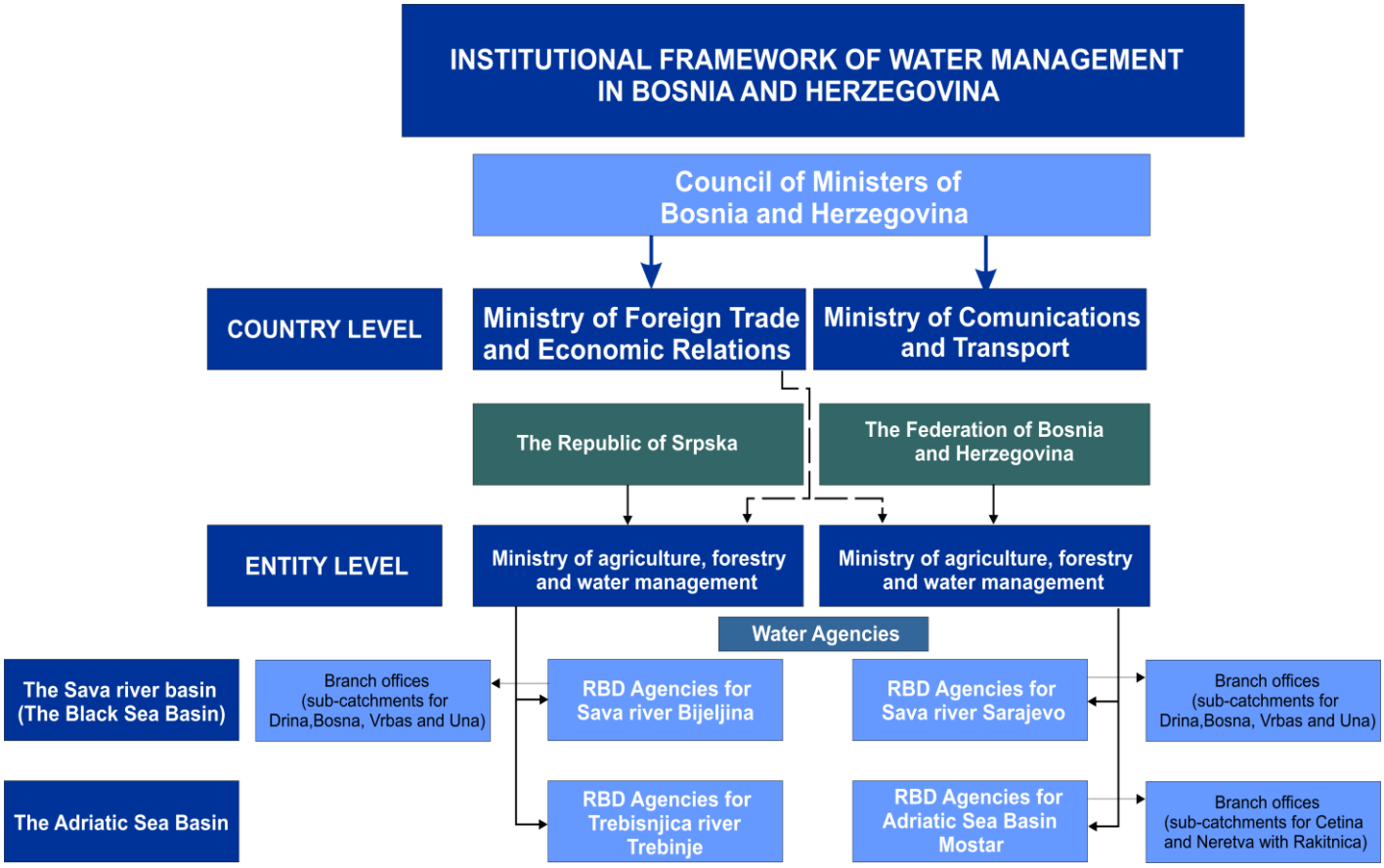



***Figure 10: Institutional Framework of Water Management B&H (RS and FB&H)***

The responsibility for implementation of WFD in B&H is on both entity Ministries of Agriculture, Water Management and Forestry. Entity Ministries are responsible for preparation of entity Strategies for Water Management until 2009 for the period of 12 years. These strategies must be coordinated and harmonized in order to provide a unique Strategy for the whole territory of B&H. In order to implement the Strategy, Water Management Plans for river basins have to be created, especially for the Sava river basin and the Adriatic Sea basin. The responsible bodies for producing Water Management Plans are the Water Agencies, up until 2012 for the FB&H, and 2015 for the RS. These Plans will be revised and updated every

6 years. The working plans for the preparation of Water Management Plans will be announced to the public at least 3 years before adoption of the Plan.

The FB&H, in comparison with the RS, has a specific situation where each of the 10 cantons has their own cantonal ministries responsible for water management issues, and also their own cantonal Laws on Water. Each Canton is responsible for water management within its borders, but the cantonal laws have to be in accordance with the Federal Law on Water. The jurisdiction of cantonal ministries in the water sector encompasses the following:

- Water protection and the regulation of water regimes;
- Protection from flooding and erosions;
- Water supply services for domestic, industrial and agricultural sectors; and
- Water sector development planning.

Municipalities, the constitutive part of the cantons, are responsible for their own water supply and wastewater collection and treatment, and are the founders of water utilities. In the RS, where there are no cantons, municipalities have the jurisdiction over local water protection. Each municipality in the RS is responsible for its own water supply and wastewater collection and treatment, and are the financiers of water utilities. According to the Law on Public Companies ("Official Gazette of FB&H", No. 8/05; "Official Gazette of RS", No. 75/04), water utilities have the following responsibilities at the local level:

- Production and distribution of water;
- Wastewater treatment and drainage;
- Sanitary-technical activities and water quality control; and
- Management of public water supply and sewage.

**Key Measures to Improve the Institutional Framework**

- Ensure regular vertical and horizontal communication and cooperation between all interested parties in the water sector. Inter-entity cooperation is crucial given that 6 of the 7 main rivers flow through both entities. To date FB&H and RS have had disparate environmental aims and methods for fulfilling these aims, but efforts to harmonise Laws and institutions are underway, albeit in the earlier stages;
- Introduce IWRM at river basin level;
- Establish bodies at national or entity level responsible for detailed analyses and implementing measures to improve water management in rural areas (within MoAFWM or Water Agencies).

### B.1.5. Economic Framework of Sector

According to the entity Laws on Water, there are the following charges/fees:

a. General water management fee, paid by all employees in the amount of 0,5% of their net salary (this fee exists only in the FB&H);
b. Water abstraction fees, which include:
    1) abstraction for public water supply, paid by water supply companies and then passed to the final consumers for payment (KM/$m^3$);
    2) abstraction for producing bottled water and mineral water (KM/$m^3$);
    3) water abstraction for irrigation (KM/$m^3$);
    4) utilization of water for fish farming (KM/$m^3$);
    5) water for industrial processes, including thermo power plants (KM/$m^3$);
    6) water for other purposes (KM/$m^3$).

c. Special water fee for production of electricity using hydro energy (kWh/m3);
d. Water protection fees:
    1) fee paid by owners of transport vehicles using oil and oil products;
    2) for wastewater discharge based on PE (Population Equivalent);
    3) for fish farming, paid in KM/kg of produces fish;
    4) for using fertilizers and chemicals for crop protection;
e. Charges/fees for sand and gravel abstraction (KM/m3 of sand/gravel)
f. Charges/fees for protection from waters, paid by:
    1) owners of agricultural, forest or construction land protected by water protection objects (KM/ha);
    2) owners of residential, business and other facilities protected by water protection objects (KM/$m^2$).

How the aforementioned charges/fees are calculated/determined is unknown, but they are done so by the entity Governments.
In the FB&H, these charges/fees are divided among the following institutions:

- 40% to the relevant Water Agency;
- 45% to the Canton; and
- 15% to the Environment Protection Fund.

In the RS, the division of charges/fees, except for item d. charges 1), 2), 3), is as follows:

- 70% for special water purposes;
- 30% for local authorities.

Item d. charges 1), 2), 3), are divided as follows:

- 55% for special water purposes;
- 15% for environment protection in RS;
- 30% for local authorities.

The tax bases for the water management fees, as prescribed by the decisions of the new Laws on Water, are given in Table 4 below.

***Table 4: Tax Base for Water Management Fees*** *Source: Federal Statistical Institute*

| Fees | Unit | FB&H | RS |
|---|---|---|---|
| **Water abstraction fees** | | | |
| For public water supply | KM/$m^3$ | 0.01 | 0.01 |
| Self supply | KM/$m^3$ | - | 0.02 |
| For bottling water and mineral water | KM/$m^3$ | 2.00 | 2.00 |
| For irrigation | KM/$m^3$ | 0.00 | 0.002 |
| For industry, incl. thermo power plants | KM/$m^3$ | 0.03 | 0.02 |
| For usage of water for: | | | |
| -carp fish farms | KM/$m^3$ | - | 0.005 |
| -trout fish farms | KM/$m^3$ | - | 0.002 |
| For other purposes | KM/$m^3$ | 0.03 | 0.01 |

| | | | |
|---|---|---|---|
| **Electricity production fee** | KM/kWh | 0.001 | 0.001 |
| **Water protection fees** | | | |
| For transport vehicles using oil or oil derivatives | KM/ES | 2.00 | 2.00 |
| For wastewater discharge | KM/ES | 2.00 | 2.00 |
| For fish-farming | KM/kg of fish | 0.05 | 0.04 |
| For using fertilizers | KM/kg of produced or imported fertilizer | 0.005 | 0.005 |
| For using chemical in plants protection | KM/kg of produced or imported chemicals | 0.075 | 0.075 |
| **Gravel extraction fee** | KM/$m^3$ of gravel | 1.50 | 1.50 |
| **Flood protection fee** | | | |
| For protection of agricultural, forestry, or construction land | KM/ha | 5.00 | - |
| For protection of residential, commercial, or other facilities | KM/$m^2$ | 0.10 | - |

In FB&H, before the new Water Law was enforced in 2007, approximately KM21 million was collected from special water fees annually. 70% (KM 14.7 million) was distributed to the public companies for water management (restructured in Water Agencies), 20% (KM 4.2 million) to the Cantons and 10% (KM 2.1 million) to the FB&H budget (MoAWF). These funds are subsequently used for overall management of the water sector, including inter alia, water quality monitoring, maintenance of flood control facilities owned by FB&H, strategic studies, infrastructural building/rehabilitation, drainage and waste water treatment.

In RS, total revenues of the RS Waters Directorate (restructured in Water Agency) in 2003 was KM9.45 million, while its 2003 budget was KM6.8 million. The financial plan envisaged KM 0,6 million, or 9.4%, to be allocated for co-financing of water supply systems, while KM 0.7 million (10.3%) will be used for capital maintenance. Besides the RS Waters Directorate, local communities and public utilities co-financed water supply system and sewerage facility construction and maintenance.

The revenues collected from water management fees are earmarked for investments in the water sector. These typically include construction and maintenance of systems, the production of water management plans and other activities in accordance with the annual plan and program of the relevant ministries responsible for water. However, in reality the collection of fees is far from satisfactory. Historically the Water Agency for the Adriatic Sea watershed has collected only 17% of all receivables, whilst the Water Agency for the Sava watershed collected 43%.[24]

[24] Draft Federal Strategy for Water Management (2009).

Financial analysis of the water supply sector in RS suggested the price of water services should not exceed 5% of average household income. Data from the Framework Plan for Development of Water Management in RS indicates that 710 million euro is needed for rehabilitation and expansion of water supply systems. About 170 million euro (24%) can be provided from water fees, but the remainder must come from other sources. In addition it is estimated that 1 billion euro is required for reducing the discharge of industrial effluents (about 5 million EI) to a level consistent with EU standards.

Local authorities (municipalities) are responsible for drinking water and sanitation pricing policies. Water utilities propose the prices, but the Municipality Council makes the final decision. No decisions or policies are made at higher administrative levels that determine a unique water price for all, and consequently prices tend to differ slightly from one municipality to another. Water utilities are largely dissatisfied with the prices set as they do not cover full service costs, but rather a fraction of operational and maintenance costs. Construction and maintenance of infrastructure is financed by the water utilities and local communities through subsidies, grants, borrowing etc, and partially by participation of the public water management companies.

There are cross-subsidies across different consumer categories. Water supply prices for the industrial sector are typically 2-3 or more times higher compared to household prices under the same Water utility (e.g. in Sarajevo: 0.625 Euro (household), 1.58 Euro (industry)). All Water Companies have the same price structure consisting of the following elements:

- Price of water (KM/$m^3$);
- VAT on water price;
- Price of sewage (KM/$m^3$ of water used);
- VAT on sewage price;
- Internalised resource costs through a "water abstraction fee"; and
- Internalized environmental costs through a "water protection fee".

The last two items are known as the special water management fees. The standard special water fee amount is determined by the entity governments based on proposals from the entity ministries responsible for water and environment, and after agreement with the entity ministries responsible for finance.

**Key Measures to Improve Sector Financing**

- Water supply services should be appropriately priced so as to cover the cost of services and enable re-investment;
- Funding of the water sector should be made more sustainable, efficient and transparent;
- A comprehensive sector finance study should be undertaken that does not neglect rural areas. Currently available financing studies in the sector give only a rough estimation of the necessary financial resources need for sector improvement; and
- Entity Government budget allocation needs to be better aligned with the situation on the ground. Better inter-ministry communication would help in this regard.

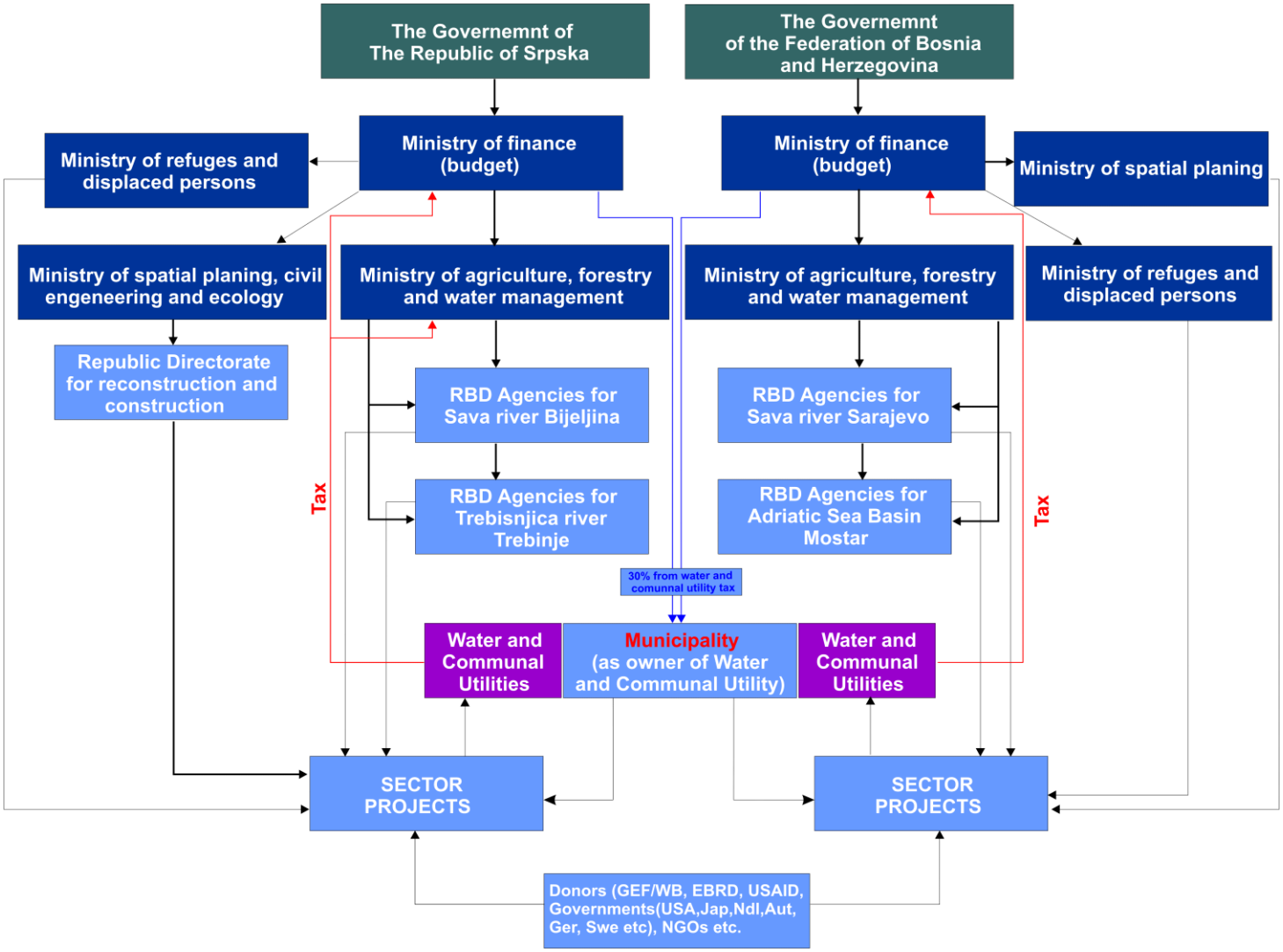



***Figure 11: Financial Framework of Water Supply and Sewerage Systems in B&H***

### B.1.6. Sector Capacity

Sector capacity building at national, entity, canton and especially municipality level is much-needed for sector development. Municipal authorities' capacity is especially weak as a consequence of the civil war (1992-1995) and historical local governance weaknesses. Most municipalities' strategic documents are aligned with the entity strategies, but they have insufficient capacities to implement water sector reforms, and little efforts are being made to improve the situation at local level. Municipalities are owners of water and sanitation Utilities are the units of governance closest to inhabitants, but their inability to provide continual, sufficient, quality services has resulted in low public trust of local authorities.

Popular belief is that public participation in decision-making has a negligible impact, and decisions are overwhelming those of political parties. Participation is commonly constrained by a lack of political will to include the public in decision-making processes as well as public misunderstanding regarding their role and responsibilities. This situation is not helped by the lack of public access to information pertaining to public services. Research further highlights the sector is characterised by obsolete knowledge and skills, and bureaucratic habits in local

self-governance. Units of local self-governance are not entirely focused on needs on the ground, nor able to implement effective policies.

**Key Measures to Improve Sector Capacity**

- Adopt a sector wide approach to improve governance at all levels so they can meet their obligations. Organize training and workshops to help employees acquire new knowledge and skills, including a comprehensive understanding of domestic and EU policy;
- Special attention should be made to strengthening municipal departments for water and communal utilities;
- Arrange a study trip to analyse new EU parties that have successfully passed through the transition period; and
- Raise community awareness of their role and responsibilities in local governance and increase legal pressure for the administrative bodies to include the public in decision-making processes.