Hungary

The European Commission and the OECD jointly review investment needs and financing capacities for water supply, sanitation and flood protection in each of the European Union's 28 member countries[1]. A fact sheet was developed for each country. Each fact sheet: (i) highlights the main drivers of future expenditure and quantifies projected investment needs; and (ii) analyses past sources of financing as well as capacities to finance future needs.

The analysis reflected in the fact sheets aims to support cross-country comparisons. For some indicators, trade-offs had to be made between reporting the most up-to-date and accurate data for each individual country and using data available for all countries in order to support such cross-country comparisons. The fact sheets were reviewed by country authorities and have been revised to reflect comments as much as possible. Inaccuracies on selected items may remain, which reflect discrepancies between national and international data sources.

A full methodological document will be published to explain in detail the sources, categories and methods used to produce estimates. In a nutshell:

- Current levels of expenditure (baseline) on water supply and sanitation are based on a range of data sets from Eurostat, which combine water-related public and household expenditures.
- Projections on future expenditures for water supply and sanitation are driven by the growth in urban population. Additional scenarios for water supply and sanitation were developed to factor in such drivers such as compliance with Drinking Water Directive (DWD), Urban Wastewater Treatment Directive (UWWTD) and emerging EU water directives.
- The paucity of data on current levels of flood protection expenditures did not allow for monetisation of projected future investment needs. Projections of growth rates of future expenditures for flood protection combine estimates of exposure of population, assets and GDP to risks of coastal or river floods.
- The characterisation of past sources of financing in each country is derived from baseline data on current levels of public and household expenditures, debt finance and EU transfers.
- Countries' future financing capacities are approximated by analysing room for manoeuvre in 3 areas: i) the ability to raise the price of water services (taking into account affordability concerns); ii) the ability to increase public spending; and iii) the ability to tap into private finance. Affordability analysis is based on water-related household baseline expenditures, not on average tariffs (which are highly uncertain, inaccurate and not comparable across countries).

[1] Further information and project outputs can be found on the websites of the European Commission and the OECD.

The future costs of diffuse pollution, compliance with the Water Framework Directive, adaptation to climate change, contaminants of emerging concern, urban floods from heavy rains, as well as the potential of innovation to minimise future financing needs are explored qualitatively and will be reflected separately. Costs related to water storage and bulk water supply are not considered.

Key messages

- Financing O&M for water supply and sanitation is a challenge.
- Additional investment is required to extend coverage by wastewater collection and treatment services, protect against flood risks in a changing climate.
- In recent years, reliance on EU funding has been high.

Context

Hungary ranks below the EU average in terms of GDP per capita, but is expected to exhibit higher than average growth over the coming years. This is despite a projected fall in total population, particularly marked in rural areas. Despite ranking first in terms of population connected to water supply, the quality and extent of wastewater infrastructure is closer to the EU average.

Climate change is likely to affect the availability and quality of water in Hungary, as climate is expected to shift towards a Mediterranean type (Barreto et al., 2017). Water resources in Hungary already show regional and seasonal variations, which may escalate with climate change and cause changes in water consumption patterns. On the one hand, droughts are already prevalent, especially in the Great Plains. Extreme droughts resulted in financial losses of around 1.4% of GDP in 2012 (OECD, 2018). On the other hand, an increase in the frequency and intensity of heavy precipitation will increase costly floods in inhabited areas (OECD 2013).

Table 1 presents a number of key indicators characterising the country context and features relevant to future expenditures for WSS and flood protection. These indicators are further discussed in the next sections, including those that underpin the projections of future investment needs.

Table 1. Key features relevant to future expenditures for WSS and flood protection

	Indicator	Value (rank if applicable)	Data Source	Year
Economy and Demographics	GDP per capita	EUR 11 600 (24/28)	Eurostat	2016
	Projected GDP growth	2.6% (11/28)	IMF	2016-2022
	Projected urban population variation by 2050	1.07x (19/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 114	Authors based on EUROSTAT	2011-2015
	Population not connected	4.8%	KSH, 2016	2015
	Annual domestic sector consumption per capita	34.2 m3	KSH 2000	
	Leakage rate for public water supply	25%	EC	2017
	Non-revenue water	21%	EurEau	2017
	Compliance with UWWTD Art.3, 4 and 5 (Index)	96% (14/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 16	EC survey	2013-15
	Pop. potentially affected in flood risk areas	not available	EC report	2015
	Value of assets at risk (rise 2015-30):	1.2x (7/28)	WRI	2015-2030

Note: A rank of 1 implies best in class.

Main drivers and projections of future investment needs

Water supply and sanitation

Investment in water supply and wastewater networks in Hungary has increased significantly in the last decade, driven by compliance with EU directives and supported by EU funds (OECD, 2018). The drinking water infrastructure network is complete and 97% of the population is connected (World Bank, 2015). More than 95% of drinking water comes from groundwater (Barreto et al, 2017). The wastewater infrastructure network covers 78.6% of the Hungarian population, with disparities by regions and income groups. Further investment in infrastructure (such as new wastewater treatment plants) is needed to achieve compliance with the UWWTD (EC, 2017).

While most water assets have been sufficiently maintained during the last two decades, few utilities have sufficient funding reserves for future replacement. This could be problematic as current tariffs are not sufficient for full cost-recovery (World Bank, 2015). Further domestic public and private funding is needed to ensure that EU-funded investments in water facilities can be adequately maintained.

Most water utility managers are aware of climate change risks but are generally focused on the short-term challenge of maintaining high-level operations under deteriorating financial conditions. Climate change is rarely addressed in strategic plans and risk management systems are generally not in place within the utilities (World Bank, 2015).

A new National Reconstruction Fund for Water Utility Supplies will be operational in the 2018 budgetary period.

Table 2. Water supply and sanitation: Projected investment needs to 2050 (million EUR)

HUNGARY		Baseline 2015	2020	2030	*Total by 2030*	2040	2050
BAU water supply and sanitation	**CAPEX**	**503**	**541**	**612**	-	**673**	**731**
	TOTEX	**1134**	**1153**	**1193**		**1210**	**1219**
Scenario Compliance + for water supply and sanitation	**ADD. CAPEX**	-	**203**	**207**	***2237***	-	-
	ADD. TOTEX		**434**	**408**	***4596***		
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	14	14	*144*	-	-
	ADD. TOTEX		31	31	*313*		
Compliance with UWWTD (sanitation)	ADD. CAPEX		189	193	2093		
	ADD. TOTEX		403	376	4284		

Note: BAU projections on future expenditures for water supply and sanitation are estimated based on the growth in urban population. Additional scenarios for water supply and sanitation are based on drivers relating to compliance the DWD and UWWTD as well as (for water supply) the cost of connecting vulnerable groups and of reduced leakage. The projections do not take into account the age and pace of renewal of water supply and sanitation assets due to the lack of comprehensive and comparable data across EU member countries.
Source: OECD analysis based on Eurostat (water-related public and household expenditure data) for the baseline; United Nations and Eurostat (total and urban population statistics and projections); European Commission (estimates of costs of compliance with revised DWD and of connecting vulnerable groups, leakage rates, and distance to compliance with UWWTD).

Flood risk management

Close to one-quarter of the country's territory is exposed to floods. The most populated flood-prone settlements are located in the eastern part of the Great Hungarian floodplain of the Tisza and Körös catchments (EEA, 2016). The majority of the country's floodplain is bordered by approximately 4,200km long levee network.

The Vásárhelyi Plan is the national framework for flood management. It was initially developed in 1999, and revised in 2003 following the severe floods of the Tisza in 2002. The main goal of the Vásárhelyi Plan is to divert floodwater into emergency storage reservoirs, which were constructed along the Tisza River. Infrastructure under the plan is primarily supported by EU funding, which will not cover all proposed maintenance and construction (EC, 2017).

Table 3 highlights growth factors in future investment needs for protection against riverine flood risks.

Table 3. Protection against coastal and river flood risks: Projected growth rates of investment needs to 2030

	Expenditures to protect against river flood risk			Expenditures to protect against coastal flood risk
	Total growth factors, by 2030			Categories (1-4), by 2030
	Expected urban damage	Expected affected population	Expected affected GDP	
Hungary	2,30	2,13	3,24	na

Note: It was not possible to establish a robust baseline of current expenditures for flood protection due to the absence of comprehensive and comparable data across EU member countries. As a result, this table presents projected growth factors in future expenditures. A growth factor is defined as the factor by which current flood risk expenditures should be multiplied in order to maintain current flood risk protection standards in the future (by 2030). For coastal flood, countries were classified in one of four categories of projected coastal flood risk investment needs, in which 1 indicates very low growth of projected investment needs and 4 very high growth of projected investment needs by 2030.
Source: OECD analysis based on the Aqueduct Global Flood Analyzer of the World Resources Institute (river flood impacts by urban damage, affected GDP, and affected population), the global database of FLOod PROtection Standards (Scussolini et al., 2016) (for countries river flood-related protection level), the European Commission Joint Research Centre (change of build-up in areas vulnerable for coastal flooding), a 2010 study by Hinkel et al, (number of people exposed to coastal flooding, and damage costs in the case of a coastal flood event).

In response to climate change, a national climate strategy (NÉS) was adopted in 2008, and in 2013 a separate national water strategy was developed that emphasizes the protection of water resources (World Bank, 2015). Both documents focus on flood and drought risk.

Other pressures affecting water quality compliance with WFD

In the first generation of RBMPs Hungary reported the status of 869 rivers, 213 lakes and 185 groundwater bodies of which 30-45% of surface water bodies had unknown ecological status. Due to improved data management and methods the information gap in the monitoring system has significantly decreased in the RBMP2, as a result, the number of surface water bodies of unknown ecological status has also declined significantly. The leading pressures on surface waters are river management, flow regulation and morphological alterations (EC 2017).

Transboundary water issues are particularly prevalent in Hungary, as large parts of the catchment area are outside national borders and therefore exposed to other countries' water management systems (OECD, 2018). Despite recent improvements, nitrogen and phosphorus loads in the Danube River Basin are 30% and 20% higher, respectively, than the reference conditions of the 1950s (OECD, 2018).

The quality of groundwater is crucial in Hungary due to its vital role in drinking water supply. More than half of the groundwater bodies achieved good overall status in 2015, and the main pressures are water abstraction followed by diffuse sources of pollution (OECD, 2018).

Past Financing strategies and room for manoeuvre to finance future needs

Water supply and sanitation

Tariffs for water and wastewater services are low in Hungary, and not sufficient to fund asset renewal (World Bank, 2015). On average, the cost recovery ratio for tariffs is less than in other countries in the Danube region (96%) and in the European Union as a whole (110%)

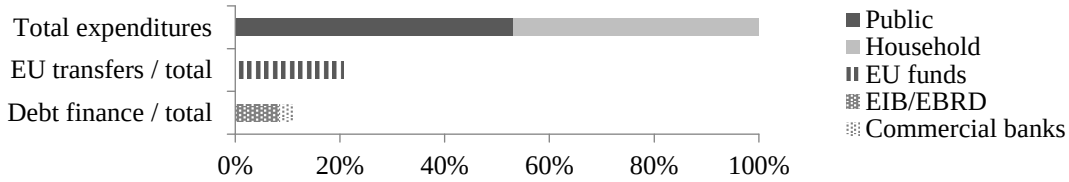
(OECD, 2018). In addition, water and sewerage tariffs were frozen in 2012 and were decreased by law in 2013, further depleting revenues for utilities. This cut has rendered maintenance problematic for many operators (World Bank, 2015).

Water affordability is an issue for the low-income population in Hungary. In the poorest 10 sub-regions of the country, the potential cost of water in the average household budget is close to 10% (World Bank, 2015).

Most of Hungary's recent water investments have been financed by government transfers and EU funds. According to a 2013 evaluation, investment needed to improve water quality in Hungary up to 2020 is estimated at EUR 415 to EUR 460 million.

As depicted in Figure 1, Hungary has been relying slightly more on public than household expenditures to finance WSS-related capital and operational expenses. Over 20% of total expenditures have been dependent on EU transfers, compared to an average of about 12% across member states. The provision of debt by European multilateral banks highlights trust in the financial sustainability of at least some projects.

Figure 1. Share of annual average expenditure on WSS, by source (2011-15 average, %)



Source: EUROSTAT (for public and household expenditures), European Commission (for EU transfers), European Bank for Reconstruction and Development, European Investment Bank, IJ Global, Thomson Reuters, Dealogic (for debt finance).

Hungary is achieving the compliance with the cost recovery principle not only by changing the tariff rates, but by other means as well. The water sector's reconstruction needs have been recently assessed and Hungary is in the process of developing a financing model, which will meet the principle of full cost recovery. A National Reconstruction Fund for Water Utility Supplies will start its operation in the 2018 fiscal year. The Parliament has allocated HUF 1.5 billion for the National Reconstruction Fund for Water Utility Supplies in order to solve the financial difficulties of the sector (Act C of 2017 on the Central Budget of Hungary, Annex 1, Chapter XVII., Title 20, Subtitle 35, Article 14). A separate proposal has been made to regulate the use of the allocated amount, which will be submitted to the Government, for approval in the second half of 2018.

Table 4 indicates that Hungary's current reliance on tax and EU transfer-based public spending may be financially sustainable for the time being, but will not cover full costs into the future. Raising tariffs towards full-cost recovery would on the other hand raise affordability concerns for low income households.

Table 4. Indicators of future financing capacities for water supply and sanitation

	Indicator	Value (rank)	Year	Data Source	Assessment
Ability to price water	Country-level average price for water supply and sanitation / m3 (PPP)	0.4 EUR (22/27)	2007	EC Joint Research Centre (forthcoming)	Low
	Water expenditures in lowest household income decile	2.26% (18/26)	2011-15	Authors based on EUROSTAT	
	Full cost recovery equivalent in lowest household income decile	4.83% (26/28)	2011-15	Authors based on EUROSTAT	
	At-risk-of-poverty rate	14.5% (9/28)	2016	EUROSTAT	
Ability to raise public spending	Tax revenue / GDP	39.4% (18/28)	2016	EUROSTAT	Medium
	Government consolidated debt / GDP	73.9% (17/28)	2016	EUROSTAT	
	Sovereign rating	BBB-	2017	Standard & Poor's	
Ability to attract private finance	Domestic credit to private sector / GDP	36% (27/28)	2015	World Bank	Low

Flood risk management

The Vásárhelyi Plan is currently composed of individual projects highly dependent on funding from the EU Cohesion Policy (EC, 2017). Flood protection will continue to benefit from EU support under the framework of Environment and Energy Operational Programme (EEOP), for which EUR 607 million was allocated for flood protection over the period between 2007-13 (OECD, 2013), and EUR 3.22 billion will be allocated in 2014-20. This will be split between flood protection and climate adaptation; infrastructure in the water, wastewater and waste sectors; improved nature protection, and increased energy efficiency (OECD 2018). Flood investments are generally focused on traditional hard infrastructure (EC, 2017).

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