

Romania

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 countries¹. 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

- Significant challenges related to coverage and performance of existing infrastructure
- Good use of pricing instruments, but affordability issues are already present
- Major urban-rural differences in service quality and coverage
- Good natural water quality is affected by pollution from agriculture and wastewater
- Climate change likely to increase risks associated with both flooding and drought

Context

Romania lies almost entirely in the Danube River basin, of which it comprises 30% (Danube Water Program, 2015). That river supplies 44% of Romania's total fresh water resources, with 46% coming from other inland rivers, and 10% from aquifers. In the country's mountainous regions, river quality remains high. However the Danube and lower reaches of inland rivers suffer from contamination (Danube Water Program, 2015). The Danube flows into the Black Sea in Romania, carrying wastewater discharges and diffuse pollution from upstream countries and domestic sources (agricultural production, industrial use, and contamination from households) through the country and into the river's delta (WWF, 2018).

Romania has a relatively low intensity of freshwater abstraction as a proportion of available resources and per-capita abstraction below the European average. However, water quality issues mean that the amount of effectively usable water is about one-third of freshwater resources (EC, 2017).

Surface waters requiring treatment meet approximately 62% of Romania's drinking water needs, with the remainder drawn from groundwater (Danube Water Program, 2015). Industry is the largest user of freshwater resources, accounting for around 67% of total use, with agriculture (mostly irrigation) and domestic users accounting for the rest. The total amount used in industry has reduced significantly since the 1990s, through a combination of falling economic output and adoption of water-saving technologies.

Romania's land area is about 58% dedicated to agricultural production (4th highest in the EU), with forestry (33%) the next largest land-use type (Eurostat, 2017). Services and residential areas cover just 1.7% of the country, the lowest rate amongst all member states. This allocation of land use is highly stable, with Romania's annual land cover change rate of 0.05% amongst the very lowest in Europe (EEA, 2017a).

Romania's level of per-capita GDP is comparatively low in the EU, although economic growth projections sit near the top. Table 1 presents a number of further 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 8 600 (27/28)	Eurostat	2016
	Projected GDP growth	13.3% (3/28)	IMF	2016-2022
	Projected urban population variation by 2050	1.01x (24/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 56	Authors based on Eurostat	2011-2015
	Population not connected	43%	EC	2015
	Annual domestic sector consumption per capita	28.7 m3	Eurostat	
	Leakage rate for public water supply	17%	EC	2017
	Non-revenue water	c.40%	EurEau	2017
	Compliance with UWWTD Art.3, 4 and 5 (Index)	51% (24/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 8 (8/27)	EC survey	2013-15
	Pop. potentially affected in flood risk areas	39%	EC report	2015
	Value of assets at risk (rise 2015-30):	1.75x (17/28)	WRI	2015-2030

Note: Rank 1 implies best in class among the EU member countries for which data is available for each indicator.

Main drivers and projections of future investment needs

Water supply and sanitation

By 2050, Romania's urban population is expected to remain roughly at its current size of around 10 million, while rural population is forecast to fall by nearly 40% from nearly 9 million in 2017 to about 5.4 million (UN, 2017). This will likely pose significant challenges to future infrastructure provision and financing.

Romania's water sector is characterised by low level of expenditure per capita, resulting in poor connection and poor performance of existing infrastructures. At the moment, approximately 60-70% of Romania's population is connected to piped water supply, with over half connected to Large Water Supply Zones (Danube Water Program, 2015; Eureau, 2017). This is well below regional and EU averages. Further, access rates can fall as low as 30% in some rural regions. Nonetheless, Romania exhibits high compliance with the EC's Drinking Water Directive quality indicators (EC, 2015). However, data remains patchy, with nearly three quarters of large water supply zones not adequately monitored.

The quality of infrastructure remains an issue, with much of the installed technology inefficient and outmoded (Danube Water Program, 2015; EC, 2017). Non-revenue water accounts for as much as 45% of water supplied, which can reflect both distribution losses and water supplied free of charge. Although in line with regional averages, this rate is high compared to the average of most other EU member states (EurEau, 2017).

Romania remains subject to a period of transition in its obligation to comply with the EC's Urban Wastewater Treatment Directive. As at 2014, about 60% of wastewater collected received secondary treatment and 25% was subject to additional treatment (EC, 2017). Full compliance still eludes all but one of Romania's 1 852 agglomerations. Moreover, the rate of connection to collection services, about 50% at the national level, remains a challenge, with rural areas lagging well behind urban centres (Danube Water Program, 2015).

Table 2 projects future investment needs in water supply and sanitation for a business as usual and a compliance scenario. The compliance scenario consists of two dimensions (1) investments needed to comply with the revised DWD, extend access to vulnerable populations and improve network efficiency (reduce leakage); and (2) investments needed to comply with the UWWTD.

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

ROMANIA		Baseline 2015	2020	2030	Total by 2030	2040	2050
BAU water supply and sanitation	CAPEX	208	280	402	-	532	670
	TOTEX	1117	1097	1087	-	1097	1117
Scenario Compliance + for water supply and sanitation	ADD. CAPEX	-	649	395	5609	-	-
	ADD. TOTEX	-	2694	1373	21606	-	-
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	126	126	1263	-	-
	ADD. TOTEX	-	647	647	6469	-	-
Compliance with UWWTD (sanitation)	ADD. CAPEX	-	522	269	4347	-	-
	ADD. TOTEX	-	2048	726	15137	-	-

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).

In addition, asset renewal rate for water supply and sanitation infrastructure will need to increase to meet EC and national objectives (Danube Water Program, 2015). Given tariff affordability is already stretched compared to other member states (see Table 4 below), there may be limited scope to raise funds to finance investment needs from water users.

Flood risk management

Romania is at risk of flooding in much of its territory, with these risks likely to increase due to both demographic and climate changes (Danube Water Program, 2015). About 13% of the country lies in floodplains, which have been subject to 20 significant flood events from 2002-2013, causing fatalities and economic damage (EC, 2017). Romania faces an increase in the value of assets at risk due to possible future riverine flooding slightly below the EU member

country median (WRI, 2015). At the same time, droughts are likely to become more common due to changing and highly localised rainfall patterns (WWF, 2018).

Table 3 highlights growth factors in future investment needs for protection against (riverine and coastal) flood risks. The increase in the value of assets at risk from future river flood events is higher than in most other EU member countries.

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	
Romania	2,39	1,69	3,04	2

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 rates in future expenditures.

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 (for countries river flood-related protection level), the European Commission Joint Research Centre (change of build-up in areas vulnerable for coastal flooding), a study 2010 by Hinkel et al. (number of people exposed to coastal flooding, and damage costs in the case of a coastal flood event).

Other pressures affecting compliance with WFD

About 64% of natural water bodies and 38% modified/artificial water bodies meet the standard of “good ecological status” or better required by the EU Water Framework Directive (EC, 2017). However, chemical and quantitative issues are significant.

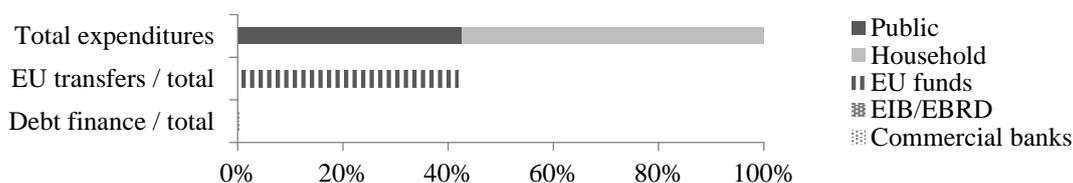
Diffuse pollution (notably from nitrates and phosphates) from agriculture is the major source of non-compliance with water quality standards, affecting one in three water bodies (EC, 2017). Hydromorphological changes affect 13% of water bodies.

Past financing strategies and room for manoeuvre to finance future needs

Water supply and sanitation

Water supply and sanitation service provision is managed at the regional level. 42 regional operators, known as Regional Operating Companies, provide services to 44% of the population, while 182 municipalities cover a further 9%. Two private concessionaires serve another 9% of the population, including Bucharest. The remaining population (38%) relies on self-provision of services.

As depicted in Figure 1, available data indicates that Romania has relied slightly more on household than public expenditures to finance its WSS-expenditures. General government tax revenue provides a small (9%) share, allocated to regions on a first-in-first-served basis. (Danube Water Program, 2015). Public expenditures have almost fully relied on EU transfers. Given low levels of water pricing in the country, the high share (70%) represented by households in total expenditures is a symptom of public underspending.

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

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).

Tariffs have risen faster than general inflation since 2008 and, at 5%, already represent a large share of average household disposable income (Danube Water Program). In rural areas and for low-income households, the share is even higher. Bill collection rates are very high at over 100%, meaning that arrears are collected as well as current charges.

Table 4 indicates that Romania faces very significant financing challenge. The country is characterised by major affordability concerns (despite already low prices), combined with limited ability to use either taxes or borrowing to fund public spending, or to tap into domestic banking sector.

Table 4. Indicators of future financing capacities

	Indicator	Value (rank)	Year	Data Source	Assessment
Ability to price water	Water expenditures in lowest household income decile	4.22% (26/26)	2011-15	Authors based on Eurostat	Low
	Full cost recovery equivalent in lowest household income decile	7.36% (28/28)	2011-15	Authors based on Eurostat	
	At-risk-of-poverty rate	25.3% (28/28)	2016	Eurostat	
Ability to raise public spending	Tax revenue / GDP	28.1% (2/28)	2016	Eurostat	Medium
	Government consolidated debt / GDP	37.6% (5/28)	2016	Eurostat	
	Sovereign rating	BBB-	2017	Standard & Poor's	
Ability to use debt finance	Domestic credit to private sector / GDP	30% (28/28)	2015	World Bank	Low

Flood risk management

The central government is responsible for developing and implementing flood protection plans at river basin level in accordance with the national Water Law and the Floods Directive. The government has adopted flood hazard maps and a programme of flood prevention goals (EC, 2017). Further studies to mitigate flood risks to exposed activities are ongoing. Nature-based flood prevention solutions in Romania's floodplains represent an opportunity for green infrastructure development.

References

European Commission (2017), EU Environmental Implementation Review Country Report - Romania. http://ec.europa.eu/environment/eir/pdf/report_ro_en.pdf

European Environment Agency (2017a), Romania Land Cover 2012 <https://www.eea.europa.eu/themes/landuse/land-cover-country-fact-sheets/ro-romania-landcover-2012.pdf/view>

European Federation of National Water Services (EurEau) (2017), Europe's Water in Figures, 2017 Edition

OECD (2013), Water and Climate Change Adaptation: Policies to Navigate Uncharted Waters, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264200449-en>

OECD (2016), *Financial Management of Flood Risk*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264257689-en>.

OECD (2017), *Groundwater Allocation: Managing Growing Pressures on Quantity and Quality*, OECD Studies on Water, OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264281554-en>

World Wildlife Fund (2018), Water Risk Filter Country Profiles. <http://waterriskfilter.panda.org/en/CountryProfiles>