

The Netherlands

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 financing needs to maintain wastewater treatment facilities
- Rainwater collection and treatment is an issue
- High exposure to flood risk, but robust financing strategy
- The location downstream of major transboundary rivers results in exposure to pollution and CECs.

Context

The Netherlands is one of the EU member states with the highest level of per-capita GDP, although future economic growth is expected to sit slightly below the EU median. The high urbanisation rate of 91% is expected to climb even higher to 96% by 2050, representing an increased urban and total population. The coverage and compliance performance of water supply and sanitation is the best in the EU, reflecting a high level of expenditure per capita. Exposure to riverine and coastal flood risks is distinctively high.

Situated in the delta of four international rivers, with a quarter of its territory below sea level, flood risk management has been central to Dutch water management for centuries. Climate change is projected to increase coastal and river flood risk, water scarcity (in some areas) and urban drainage, which will need to adapt to cope with heavier rainfall events (OECD, 2014).

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 41 300 (5/28)	Eurostat	2016
	Projected GDP growth	1.9% (19/28)	IMF	2016-2022
	Projected urban population variation by 2050	1.19x (11/28)	UN	2017-2050
Water Supply and Sanitation	Estimated annual average expenditure per capita	EUR 333	Authors based on EUROSTAT	2011-2015
	Population not connected to public water supply	0%	EUROSTAT	2015
	Annual domestic sector consumption per capita	54.7 m3	EUROSTAT	
	Leakage rate for public water supply Non-revenue water	c5%	EurEau	2017
	Compliance with UWWTD Art.3, 4 and 5	100% (1/28); 100% (1/28); 100% (1/28)	EC	2014
Flood Protection	Estimated annual average expenditure per capita	EUR 45	EC survey	2013-15
	Population potentially affected in flood risk areas	76%	EC report	2015
	Expected increase in urban damage	5,17	Authors based on WRI	2015-2030

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

Main drivers and projections of future investment needs

Climate change, urban development, economic growth and the level of acceptable risk are important cost drivers for future water management in the Netherlands (OECD, 2014). Numerous studies have estimated the future expected costs of water management in the Netherlands (see OECD 2014 for a compilation).

Water supply and sanitation

The Netherlands has very high compliance rates for drinking water quality and urban waste water treatment (EC, 2016a; EC, 2016b). Poor water quality downstream of the Rhine and Meuse rivers increases the cost of treatment for drinking water companies (OECD, 2014).

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. A major caveat is the lack of accurate cross-country data on the state of the asset and on whether the business as usual appropriately reflects the need to renew existing infrastructures.

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

NETHERLANDS		Baseline 2015	2020	2030	Total by 2030	2040	2050
BAU water supply and sanitation	CAPEX	3279	3463	3765	-	3963	4032
	TOTEX	5594	5885	6357	-	6648	6720
Scenario Compliance + for water supply and sanitation	ADD. CAPEX	-	427	449	4833	-	-
	ADD. TOTEX	-	765	797	8514	-	-
Compliance with DWD, access and efficiency (water supply)	ADD. CAPEX	-	21	21	213	-	-
	ADD. TOTEX	-	76	76	756	-	-
Compliance with UWWTD (sanitation)	ADD. CAPEX	-	406	427	4620	-	-
	ADD. TOTEX	-	689	722	7758	-	-

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).

Contaminants of emerging concern (CECs) in water could substantially increase the costs of treating drinking water beyond those presented in Table 2. A current drive to modernise environmental policy has a strong focus on public health, particularly on new potential risks (including CECs in water) (OECD, 2015).

Flood risk management

The main expected medium- and long-term cost increase arises from the need to adapt primary floods defences to the expected rise in sea and river water levels as a result of climate change (OECD, 2014). In the absence of any measures to address sea level rise², potential damages from flood risk are estimated to increase to between EUR 400 billion and EUR 800 billion by 2040, reaching EUR 3 700 billion by 2100 (RPA, 2014).

The 2012 Delta Act was passed to respond to the country's current and future water challenges regarding water safety and freshwater supply. Current flood safety standards are among the highest in the world (OECD, 2014). As part of the Delta Programme, the government introduced new standards for primary flood defences, which had to be met by 2017 (EC, 2017).

New approaches have been adopted to shift from a “defensive” approach to flood risk reduction based on hard infrastructure towards an adaptive approach to make “room for the river”, combining innovative architecture, urbanisation and landscape solutions (OECD, 2014).

² Projections of sea level rise anticipate an increase of 24 to 60 cm in 2040 and 150 cm in 2100 (EC, 2017).

Table 3 highlights growth factors in future investment needs for protection against (riverine and coastal) flood risks. Urban floods from heavy rains will be discussed separately (not in the country fact sheet).

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	
The Netherlands	5,17	8,59	10,85	4

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).

Other selected pressures affecting compliance with the WFD

According to the first generation of RBMPs, none of the natural surface water bodies achieved good or high ecological status and less than 1% of heavily modified or artificial water bodies achieved good or high ecological potential (EC, 2017).

The main pressure on Dutch surface waters is diffuse pollution that affects 90% of water bodies followed by river management that affects 73% and by flow regulation and morphological alterations. Point sources pollution and abstraction are also significant pressures. Water quality remains of high concern due to nitrate pollution (from intensive livestock and dairy farming). Eutrophication is a widespread phenomenon (EC, 2017).

Past financing strategies and room for manoeuvre to finance future needs

Water supply and sanitation

The aggregate cost of water resources management (costs incurred by public authorities as well as private organisations) is estimated at EUR 7.6 billion per year, or about 1.26% of the GDP of the Netherlands.³ At least 80% of the annual costs of water management in the Netherlands are financed via local and regional levy structures (OECD, 2014).

However, the contribution from the various sectors (households, agriculture and industry) to cost recovery is unclear as is the extent to which price incentives stimulate efficient water use (OECD, 2015). Several principles guide the financing of water resources management: “user

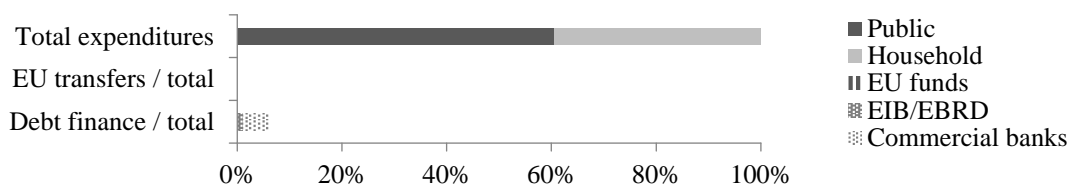
³ Estimates based on 2012 data.

pays” and “polluter pays” as well as “interest, pay, say”, reflecting the democratically elected regional authorities responsible for water (the Regional Water Associations) (OECD, 2014).

Costs related to water quality account for the largest share of total expenditures (about 2/3 of the total). This includes the cost of wastewater treatment by the regional water authorities, collection and discharge of rainwater and wastewater by municipalities and expenditure by drinking water companies (which consists, in part, of costs related to the purification of poor quality water). The total is almost entirely financed from regional levies and consumer payments (OECD, 2014). Investments to maintain wastewater infrastructure and improve the basic implementation required by the Urban Waste Water Treatment Directive remain high (around EUR 1 300 million/ year) compared to other EU member states (EC, 2017).

As shown in Figure 1, the Netherlands tend to rely slightly more on public than household expenditures to finance WSS-related investments and costs. The country has not benefited from water-related EU transfers and debt appears to have played a minimal role in financing upfront capital investments.

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 Investment Bank, IJ Global, Thomson Reuters, Dealogic (for debt finance).

Based on criteria in Table 4, the Netherlands does not face any core issue in terms of financing capacity. Current pricing is relatively modest and there is some room of manoeuvre before price levels generate critical affordability issues. Further reliance on public spending is also an option thanks to a healthy fiscal condition. Commercial debt finance would also be readily available should need be.

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

	Indicator	Value (rank)	Year	Data Source
Ability to price water	Water expenditures in lowest household income decile	1.08% (6/26)	2011-15	Authors based on EUROSTAT
	Full cost recovery equivalent in lowest household income decile	2.74% (11/28)	2011-15	Authors based on EUROSTAT
	At-risk-of-poverty rate	12.7% (4/28)	2016	EUROSTAT
Ability to raise public spending	Tax revenue / GDP	39.3% (17/28)	2016	EUROSTAT
	Government consolidated debt / GDP	61.8% (13/28)	2016	EUROSTAT
	Sovereign rating	AAA	2017	Standard & Poor's
Ability to attract private finance	Domestic credit to private sector / GDP	112% (8/28)	2015	World Bank

Flood risk management

As of 2012, expenditure for flood risk management amounted to EUR 940 million (14% of the total expenditure of water management). These flood risk management costs include investments in, and maintenance of, (mostly primary) flood protection infrastructure. The larger part of these costs was incurred by the central government, financed via national tax revenues. The Delta Fund, established by the Delta Act, aims to secure at least EUR 1 billion per year from 2020 to cover the costs of increased flood risk (OECD, 2014).

Water management and spatial development are closely connected, but those who benefit from spatial development, such as municipalities and property developers, do not necessarily bear the additional costs related to flood protection (OECD, 2014).

Dutch Regional Water Authorities benefit from a dedicated financial institution, the NWB Bank, which provides stable, predictable low-cost finance required for water-related investment (OECD, 2014).

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